NETWORK WORLD
THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING
AN INTERNATIONAL DATA GROUP PUBLICATION ◆ VOLUME 12, NUMBER 7 ◆ FEBRUARY 13, 1995

User demand is fueling the bundling fire

Second of two parts.

BY MICHAEL CSENGER AND JIM DUFFY

"Support is the hard part for [carriers] because few of them have a deep reach into customer premises equipment."

–Jim Flach, chairman, Teleos Communications

At the core of the bundling issue is this simple truth: Bundling wouldn't be an issue if customers didn't want it.

Corporate downsizing and exploding network usage are putting pressure on user budgets, and many companies are looking to augment their own net resources with bundled service and equipment packages from carriers.

Users benefit from single-source supply, service and support. And vendors such as Cisco Systems, Inc. and Bay Networks, Inc. — which do 25% to 33% of their business via carriers — benefit by generating volume through an influential channel.

See Bundling, *page 78*

Sprint faces setback in bold expansion bid

BY DAVID ROHDE

Kansas City, Mo.

Sprint Corp. last week suffered a big setback in its ambitious plan to become a major player in everything from global nets to personal communications services.

The Federal Communications Commission proposed a rule that would make it harder for foreign carriers to invest in U.S. phone companies — a move that could derail Sprint's partnership with France Telecom and Germany's Deutsche Telekom (DT). The deal would put $4.2 billion in Sprint's coffers.

That would leave Sprint the odd man out among AT&T and MCI Communications Corp. in the race to establish global partnerships. It would also eliminate an important cash source as Sprint bids on PCS licenses and expands its forays into the local loop.

Meanwhile, Sprint's stock price has fallen 25% in recent weeks. Such stock dives have killed other recent industry megadeals, such as the 1993 proposed merger of Bell Atlantic Corp. with Tele-Communications, Inc.

With the deal anything but certain — neither France Telecom nor DT has even signed a definitive agreement — top executives at Sprint are widely described as pushing hard for higher revenue and lower costs in an effort to bump up profits.

Toward that end, users two weeks ago were socked with a 15% price hike on T-1, fractional T-1 and digital data services — an unusual unilateral move that places Sprint's rates virtually on a par with AT&T's (*NW*, Feb. 6, page 23).

Frame relay prices are expected to be next.

"They're going to have service-level agreements for availability, data delivery and installation dates, and try to justify with that an increase in cost," said a Sprint customer that is now negotiating a frame relay network with several carriers.

Domenick DeAngelo, Sprint's vice president of data product management, said a decision has not been made on frame relay prices, although he confirmed that Sprint will introduce service guarantees.

More price hikes on a variety of services could be in the offing, said another observer.

"They're really looking to get money and

See Sprint, *page 78*

Multiple dilemmas

On the one hand	On the other
Sprint must boost its stock price for Deutsche Telekom and France Telecom to obtain value for their investment.	To enhance profits, Sprint is raising prices to AT&T's levels.
Sprint is seeking multiple legal approvals for its global network venture.	MCI-BT and AT&T-Unisource are already offering products and winning contracts.
Sprint lacks the capacity to withstand major net outages without service interruptions.	AT&T offers 5-minute restoral with its FASTAR system and has greater switch density to help it withstand failures.
AT&T and MCI are shipping multimedia 800 solutions.	Sprint has no comparable product.
Facing AT&T's consumer surge, MCI is boosting network investment from $1.75b in '94 to $1.9b in '95.	Facing the same surge, Sprint is firing executives and cutting costs throughout its long-distance business.

Client/server a blockbuster in Tinseltown

BY BARB COLE

Beverly Hills, Calif.

CHUCK POTTER

EDI's Kevin Huber is using client/server as a revenue source.

When movie studios and film distributors want to know how *Forrest Gump* fared against *The Lion King* the night before last, they turn to Entertainment Data, Inc. (EDI).

Now the leading collector and distributor of movie box office receipt information in North America, Germany and the U.K. is giving its high-profile Hollywood customers an easier way to access the data they need. EDI is testing a client/server system designed to let customers tap into its database at will and manipulate up-to-date information on their own PCs.

That's a big improvement over EDI's old system, which involved pumping out paper-based reports sent via courier to clients.

The company believes the new system will help double its customer base and attract a new set of clients, including production companies, investment bankers, attorneys and even candy suppliers.

"We're using client/server as a revenue source," said Kevin Huber, EDI's chief information officer. "Our growth is based on providing more information to a growing group of customers."

Now instead of receiving data only in a standardized format, EDI customers can drill deeper to determine, for example, whether a flick should first play in Peoria or Portland based on whether the people in those locales favor Stallone or Schwarzenegger.

"It's like a Rubik's Cube. The combinations of information are limitless," Huber said.

EDI will use a tiered pricing scheme under

See Client/server, *page 79*

IS seeks to avoid wireless anarchy

BY JOANIE WEXLER

As corporate wireless network plans escalate, the question rears its head: Who makes the decisions, the network and systems staff or the business units?

A year ago, packet radio net operator RAM Mobile Data told *Network World* it "avoids the network manager like the plague" on sales calls because business unit managers were more in sync with how wireless communications could help a company's bottom line.

This situation persists in some companies, though most — wiser after struggling through personal computer LAN and mainframe system integration nightmares — now tend to seek

See Wireless, *page 79*

Banyan hits DeMarc

BY KEVIN FOGARTY

Westborough, Mass.

Banyan Systems, Inc. is set to deliver on its DeMarc distributed network management plan by rolling out two new applications that run on a modified version of Hewlett-Packard Co.'s HP OpenView for Windows platform.

Outlook for HP OpenView consists of the platform as well as applications for capacity planning and network event correlation. It will be announced later this month as the first piece of the Distributed Enterprise Management Architecture (DeMarc) puzzle.

Banyan will build on that by offering a network service

See Banyan, *page 77*

INSIDE

- **Micropolis' Raidion LTX adds performance and reliability to NetWare servers.** **Page 57.**

SHAWN HENRY

- **An inside look at Tim Berners-Lee, the man who spun the World-Wide Web.** **Page 59.**

NEWSPAPER $5.00

100

Briefs

I was FRAMEd. NetFRAME Systems, Inc. next week will announce a new family of servers as well as an addition to its top-of-the-line 8500 server family. The new 100-MHz 486-based 8400 server family will include three models: the single-bus NF8410, the dual-bus NF8420 and the quad-bus NF8440. The new 100-MHz Pentium-based 8540 server, NetFRAME's highest end server, offers a quad-bus design, clustered symmetrical multiprocessing and enhanced fault tolerance. The 8400 family ranges in price from $25,000 to $40,000. The 8540 costs around $120,000. The servers will be available in March.

NetFRAME: (408) 944-0600.

Chipping away. IBM and Chipcom Corp. last week extended their strategic alliance to include IBM's upcoming Token-Ring switch and Chipcom's ONsemble StackSystem hubs. Under terms of the new agreement, IBM will resell Chipcom's stackable ONsemble Ethernet and token-ring hubs and its high-end Ethernet Galactica Network Switching Hub. Chipcom will resell IBM's 8230 Token-Ring concentrator and forthcoming 8272 Token-Ring switch.

Chipcom also announced a reseller agreement with Bell Atlantic Network Integration, Bell Atlantic Corp.'s systems integration arm. Bell Atlantic will market, resell and install the ONcore, ONline, Galactica and ONsemble families of hub and concentrator products.

Fast times at SMC. Standard Microsystems Corp. (SMC) of Hauppague, N.Y., last week announced fast Ethernet adapters for both Peripheral Component Interconnect (PCI) and Extended Industry Standard Architecture (EISA) personal computer bus architectures. Both adapters can operate at either 10M or 100M bit/sec and conform to the IEEE's 100Base-TX specifications.

Pricing starts at $259 for the EtherPower 10/100 adapter for PCI systems and $299 for the Ether 10/100 adapter for EISA systems.

SMC: (516) 273-3100.

Cisco takes ISDN route. Cisco Systems, Inc. last week announced an ISDN Primary Rate Interface for its 7000 backbone routers and an ISDN Basic Rate Interface for its remote site routing hub. At the same time, Cisco added ISDN signaling and Point-to-Point Protocol data compression to its routing software. The PRI, which supports speeds of 2M bit/sec, is called the MultiChannel Interface Processor and is available for $11,000 to $15,000. The BRI for Cisco's 2516 routing hub costs $3,795 to $6,095 and is also available now.

Cisco: (408) 526-4000.

RMON-ed and dangerous. 3Com Corp. this week will announce Remote Monitoring (RMON) capabilities across its stackable and chassis hub offerings, and switching products via agent software and application-specific integrated circuits. RMON support also will be added to 3Com's Transcend management applications. RMON functionality will be offered free of charge to new and existing 3Com customers, and will be available by the end of the year.

3Com: (408) 764-5000.

Add 3 to 8 cents and stir. Sprint Corp. and Rockwell Switching Systems Division last week disclosed terms for their deal to provide Rockwell's Spectrum automatic call distributor (ACD) without requiring a capital outlay or traditional lease (*NW*, Feb. 6, page 1). The cost is 3 to 8 cents per minute added on to Sprint's 800 or outbound services monthly bill, with the two bills delivered separately. The per-minute amount depends on the number of ACD features ordered and the length of the service and equipment contract.

Lowdown on low-speed ATM. The ATM Forum last week voted overwhelmingly to approve a technical specification for 25.6M bit/sec Asynchronous Transfer Mode on the desktop, according to forum members. "We're thrilled," said Maureen Lawrence, chief executive officer of Whitetree Network Technologies, Inc., which introduced a 25.6M bit/sec ATM switch last month. The firm teamed with IBM, Madge Networks, Inc. and others to form the ATM Alliance, an ad hoc committee that developed a 25.6M bit/sec specification for consideration by the forum.

For details on how to reach us, see page 83.

Table of Contents

NEWS

Microsoft gets closer to shipping Exchange Server. *Page 4.*

The DMTF is expected to give its stamp of approval to a pair of new standards. *Page 4.*

PeerLogic, IBM integrate DSOM and Pipes to make apps development a little easier. *Page 6.*

Large and small vendors parade new wares for 'Net users at show. *Page 8.*

Borland scheduled to unveil Delphi tool in March. *Page 8.*

IBM adds to its Unix-based server line with new platforms. *Page 12.*

Internet tip: ISDN items. *Page 12.*

Apple preps interactive videoconferencing and data-sharing packages. *Page 12.*

CE Software makes its way into enterprise arena with Boston Software Works. *Page 80.*

ENTERPRISE INTERNETWORKS

StrataCom set to unveil access shelf for BPX-based ATM switch. *Page17.*

Ascend announces frame relay support for its WAN hub line. *Page 17.*

CrossComm's Ethernet modules now equipped to handle net management. *Page 17.*

LAN WORLD

Quarterly review of innovative LAN products includes tools to relieve net management. *Page L1.*

Digital enters remote LAN access market with line of servers. *Page L1.*

Novell introduces SDK to link intelligent devices. *PageL1.*

WUGNET: Collaborating in real time over TCP/IP. *Page L2.*

GLOBAL SERVICES

ACD vendors find ways to help call center administrators stay in control. *Page 37.*

Access providers can ease users' fears about doing business on the Internet. *Page 37.*

CLIENT/SERVER APPLICATIONS

Kodak subsidiary increases pressure in imaging market with GroupStore. *Page 47.*

The OSF's DCE is on its way to the desktop, according to vendors at last week's conference. *Page 47.*

Platinum pushes into systems management with AutoSystems. *Page 47.*

OPINIONS

Dan Minoli on term limits. *Page 22.*

Editorial on switching plans. *Page 52.*

Anura Guruge on DLSw to the desktop. Page 52.

John Morency on support and scalability. *Page 53.*

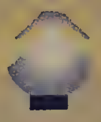
In-box. *Page 53.*

Back to Reality: Uncle Sam looks to ban Internet sex addicts. *Page 83.*

CyberSpeak. *Page 83.*

Taking a peak at networking in the next century

- **Mark Gibbs deciphers white noise.** **Page L18.**



- **Marc Myers gives a futuristic view of client/server.** **Page 48.**

Network HELP desk

Network World *tracks down answers to your questions regarding products, services, technologies or disputes with vendors. Please submit questions to Alison Conliffe via phone at (800) 622-1108, via fax at (508) 820-1103 or (508) 820-3467, via the Internet at aconliff@world.std.com or via CompuServe at 75471,2725.*

My company currently has an IBM 9370 mainframe and a Novell, Inc. NetWare PC LAN. How do we connect the two systems? What products should we look for? We would appreciate any advice you can give.

Jim Rock, Pittsburgh

Ron Nutter, a network systems engineer at IntraSource, Inc., a Novell Platinum-authorized reseller and service center in Lexington, Ky., advises:

You will need several components. The first is Novell's NetWare for SAA. This product is a series of NetWare Loadable Modules that run either on your production server or on a special run-time version of NetWare. You will need some type of terminal emulation products, such as Attachmate Corp.'s NetWare 3270 LAN Workstation for DOS or Wall Data, Inc.'s Rumba for the Mainframe, to enable the workstations to access the mainframe. You can contact Attachmate at (800) 426-6283 and Wall Data at (800) 487-8622.

If you would like to use your LAN-based printers for hard copy output instead of the expensive line printers normally associated with your type of host, consider Novell's NetWare HostPrint. This product works in conjunction with NetWare for SAA to intercept jobs that normally go to a host-based printer and to redirect them to LAN-based printers.

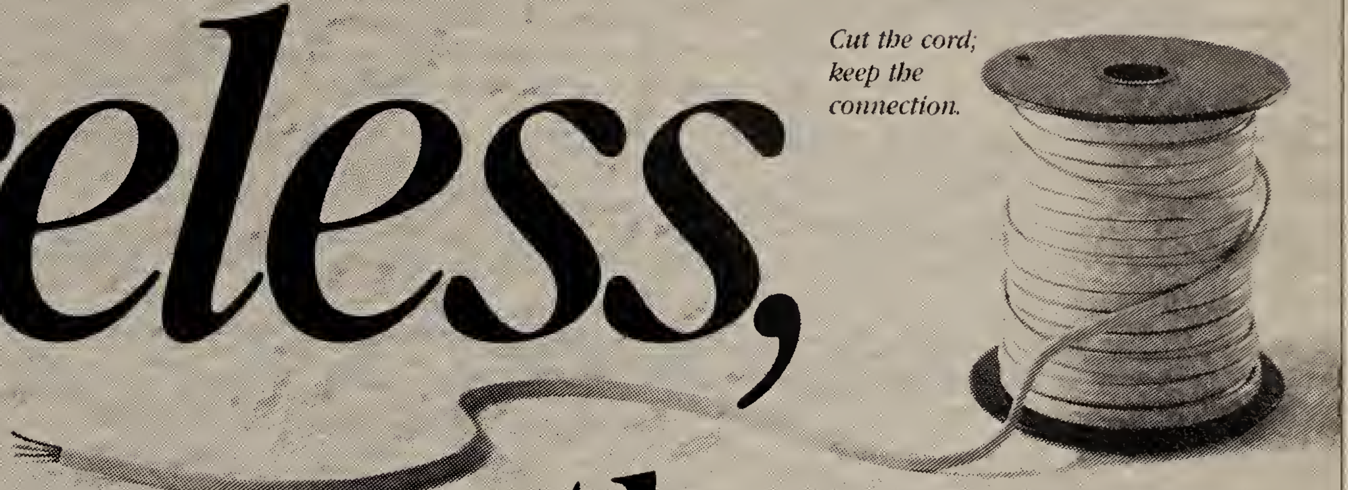
You also need to consider a couple of planning issues. The first concerns the number of terminal and printer sessions you will need. NetWare for SAA can handle a few more than 500 sessions on a single server. If you will be running more than 100 sessions, give serious consideration to running NetWare for SAA on the run-time version of NetWare. High session counts in Systems Application Architecture can slow down a production server as well as require additional RAM.

If you plan to connect locally to the 9370 host via Ethernet or token ring, I would suggest a direct connection between the mainframe and the LAN where no other LAN devices are present. This helps keep

See Help desk, *page 54*

Be reachable in unreachable places.

Before you *go* *wireless*, make *sure* there are *strings* attached.



Cut the cord; keep the connection.

If plans change, phones move in a snap.

Unwire.

Entering the world of wireless means greater flexibility for your entire office.

But you shouldn't go untethered until you find the right company to plug into. With people who understand your business. People who can guide you through the swift, technological changes transforming your world. People who can give you the freedom not merely to grow, but to soar.

No one can do all this better than AT&T Global Business Communications Systems. Because our wireless products are designed to help you work the way you want to, not the way you have to.

Call **1 800 325-7466, ext. 566**, today. Find out about the AT&T **TransTalk**™ 9000 System and our vision of the future. Because even in the wireless world, it's still important to make the right connections.

AT&T. Where innovation leads.

AT&T

© 1994 AT&T

Microsoft issues beta copies of Exchange Server software

BY PEGGY WATT

Redmond, Wash.

Microsoft Corp. last week entered the home stretch toward shipping Exchange Server, sending out 200 beta-test versions of the electronic mail/groupware program minus a few features discussed during its long development.

Testers will receive the Microsoft Windows NT-based Exchange Server and client software for 16- and 32-bit Windows as well as DOS clients. Still in development are clients for Unix and the Macintosh. Windows 95 — in a separate beta test — also includes Exchange client technology.

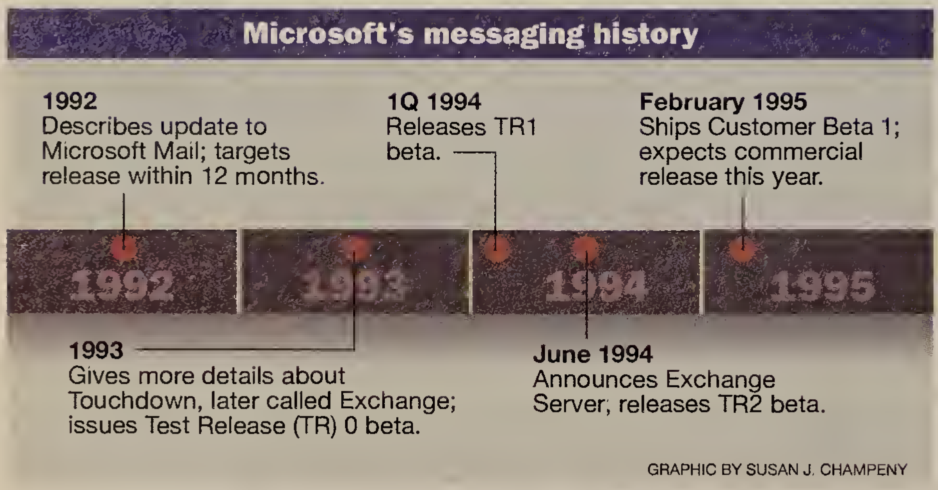
This Customer Beta 1 follows Test Release 2, which shipped last June when Microsoft announced Exchange Server. The beta pool may grow to as many as 1,000 testers before the much-delayed product's general release sometime later this year, according to Microsoft product managers at a briefing for *Network World* here last week.

Exchange Server has been delayed largely because the technology and development challenge is different from Microsoft's experience on the desktop, said Karl Wong, principal analyst with Dataquest, Inc. in San Jose, Calif.

"Messaging is much more than providing a pretty interface," he said. "They need to adhere to industry standards." But he believes Exchange Server will do well thanks to its tight integration with Windows NT and other applications.

The beta version has the promised support for the Simple Mail Transfer

See Exchange, *page 80*


Microsoft's messaging history
1992
Describes update to Microsoft Mail; targets release within 12 months.
1Q 1994
Releases TR1 beta.
February 1995
Ships Customer Beta 1; expects commercial release this year.
1992
1993
1994
1995
1993
Gives more details about Touchdown, later called Exchange; issues Test Release (TR) 0 beta.
June 1994
Announces Exchange Server; releases TR2 beta.

GRAPHIC BY SUSAN J. CHAMPENEY

IBM-led group plots standard for office automations

BY MICHAEL COONEY AND KEVIN FOGARTY

Tokyo

IBM and 15 high-technology firms are working on software that would link everything in the office from the personal computer and copier to the telephone and coffee maker down the hall.

The technology is designed to make it easier for users to link diverse office devices and manage the workplace. The consortium's effort is hardly the first of its kind: It will compete directly with Microsoft Corp., which is pitching its Microsoft At Work software, and Novell, Inc. with its NetWare Embedded Systems Technology (NEST).

NEST is designed to bring the power of NetWare to a variety of devices, from TV set-top boxes to office equipment.

"The difference is that what IBM and the other companies are working on will be an open office standard that any vendor will be able to implement. Microsoft's and Novell's are proprietary offerings," said Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C.

Dzubeck said the IBM group's code would be embedded in any office device and be controlled by a local PC. For example, a PC user could link up with a fax machine to send a document or to use it as a scanner to import a photograph.

The companies said the new technology could be incorporated into consumer products, such as a PC-based home security system that could turn on lights, lock doors and monitor the house to detect intruders.

Consortium executives said work on the standard was in the preliminary stages, but products could appear as early as 1997. IBM executives acknowledged participation in the effort but declined to comment on when or how the office technology could be deployed.

"The strength of this technology is the number of vendors putting their weight behind it," said Lynn Nye, president of the NetResults consultancy in Portland, Ore.

Other consortium members include Ricoh Co., Ltd., Matsushita Electric Industrial Co., Ltd. and Sharp Corp.

Microsoft announced Microsoft At Work in 1993 and shipped it in 1994. While the package has garnered some early endorsements from printer vendors and peripherals manufacturers, it has not been widely adopted for a number of reasons, including its large memory requirements.

Novell last week released a software developers' kit for NEST, which will let developers make their devices NetWare clients.

While the idea of embedded systems linking devices in the home is intriguing, it may be ahead of its time, said Mark Gibbs, an independent consultant and author based in Ventura, Calif.

"The infrastructure for that entire economy does not exist, and there is no demonstrable demand for it," Gibbs said. "Although it would be fun to have an RMON for my Cuisinart."

Major corporations would buy intelligent devices "in a minute," said John Dubiel, manager of planning and technology at Boston Edison. Embedded systems technology would be particularly useful on the factory floor, where users today struggle to link proprietary equipment that handles specialized functions.

"It would help reduce support costs because you could buy from different vendors and integrate it yourself," Dubiel said.

Frank Carratozzolo, senior information specialist at a major East Coast pharmaceutical manufacturer, said widespread acceptance by corporations would pave the way for home use. "But in order for [the technology] to get widespread use, it would have to be a commodity. Everyone would have to offer it off the shelf and not charge a lot extra for it," he said.

Rob Guth, IDG News Service's Tokyo correspondent, contributed to this story.

DMTF to OK standard for monitoring desktop software

BY MARGARET DORNBUSCH

Phoenix

The Desktop Management Task Force (DMTF) is expected to approve two new standards as well as determine an agenda for the next years' work during its annual meeting here this week.

The Management Information Format (MIF) specifications up for ratification include a Software MIF and a Large Mailing Operation (LMO) MIF, both of which are designed to give network management systems greater control over these elements.

The DMTF is a group of companies developing the Desktop Management Interface (DMI), a set of standards for managing desktop equipment and software.

The DMI consists of four components: the Service Layer, the Component Interface (CI), the MIF and the Management Interface (MI). The Service Layer collects information from net components through the CI and places the information in a MIF database. Network management applications call information from the MIF through the MI.

In addition to scheduling more desktop standards discussions for the next year, the group must face the sticky issue of DMI compliance, said Ki Wilson, senior microcomputer analyst at Stone Container Corp. in Chicago and chairman of the DMTF User Advisory Council. The DMTF needs to define what features out of any given MIF should be used before a device or a piece of software is compliant.

This debate comes in the wake of a December announcement by Microsoft Corp. that it would not implement the DMTF CI and Service Layer application program interfaces in Windows 95. Microsoft, Novell, Inc. and other companies this week will discuss how they will use the DMI.

The DMTF already has set standards for personal computers and network adapters, and servers.

The software MIF, in the works since August 1994, will provide a method for software publishers to communicate version identification and audit dates for their products, said Winston Bumpus, director of engineering for Novell's Management Products Division. Bumpus is chairman of the DMTF's Software Working Committee.

New specs

DMTF

Software MIF

- Describes a set of attributes for software products, such as version number and audit date.

Large Mailing Operation MIF

- Defines a set of attributes for computerized mail assembly and finishing systems.

MIF = Management Information Format

This information can be used by net managers for user support and internal auditing, as well as external auditing by piracy watchdog organizations.

The other MIF scheduled to be ratified next week is the LMO MIF for computerized mailing systems. Large mailing operations use networked devices such as printers, folding and stacking machines, and inserting and stuffing machines. The LMO MIF will define the attributes of a printing job and can be used by mailing operations management applications to coordinate the devices used in the process. ◼

VocalTec ware lets users make voice calls over 'Net

BY ADAM GAFFIN

Northvale, N.J.

A vendor whose software lets users talk across LANs is now hoping to make its voice heard on the Internet.

VocalTec, Inc. last week announced software called the Internet Phone that lets Internet users hold voice conversations across the global network. The software can save users money, particularly on international calls, by letting them establish voice conversations by dialing in to local Internet nodes rather than using traditional long-haul services, the company said.

Company President Elon Ganor said VocalTec is saving hundreds of dollars a month by using Internet Phone for conferences between its headquarters and a research and development center in Israel.

The software should prove attractive to companies as more groupware programs are made available to run over the Internet, he said.

VocalTec's software relies on proprietary compression techniques to pack 1 second of conversation into roughly 8K bits — good enough to hold half-duplex discussions over 14.4K bit/sec dial-up links to the Internet via a Serial Line Internet Protocol (SLIP) connection. The software, which runs on Intel Corp. 486-based personal computers equipped with Windows, a sound card and a microphone, also works over direct Internet connections.

Internet Phone uses a proprietary algorithm for overcoming one of the Internet's inherent properties — the way that data packets do not necessarily wind up at their destination in the same order they were sent. The soft-

See VocalTec, *page 77*

CAN PC-TO-HOST CONNECTIVITY BE THIS EASY?

YES. UNPRECEDENTED ACCESS FROM EICON AND MICROSOFT.

Now you can have unsurpassed connectivity to IBM® hosts from your preferred desktop environment. Eicon Technology's Access for Windows® and Windows NT™ operating systems allow multiple host sessions from a single desktop and the same, easy-to-use interface, while the Microsoft® SNA Server gateway assures you secure, reliable access to multiple hosts. The results: unprecedented host access plus significant cost-savings in reduced training, administration, and support.

For a free white paper on Eicon Technology and Microsoft's SNA solutions, call 1-800-267-1655.

Microsoft SNA SERVER
Microsoft

ACCESS for WINDOWS
EICON
TECHNOLOGY

Circle Reader Service #30

LAN HARDWARE

Compaq pumps out new network servers

BY MARGARET DORNBUSCH

Houston

Compaq Computer Corp. this week will roll out two servers equipped with redundancy features typically found in higher end systems.

The new servers include the ProLiant 1500, an entry-level addition to the company's flagship ProLiant server family, and the ProSignia 300, a new member of Compaq's least expensive server family.

Compaq is positioning the servers for small to midsize customers, including branch offices and departments within large corporations. Both models conceivably can support hundreds of users if deployed for simple file and print servers, while the model 1500 comfortably supports about 100 end users and the model 300 just a handful of users if deployed as good-sized application servers.

What separates the systems from others in their class is that they feature as standard or optional a series of fault-tolerant technologies, including power supplies, hot-pluggable drives and upgradable processor boards, said Monte Rector, senior business manager for Compaq's North American Division.

The stand-alone ProLiant 1500 and a rack-mountable model, the ProLiant 1500R, come with either one or two 75-MHz or 100-MHz Pentium processors. An optional FlexSMP dual processing capability can improve server performance as much as 80%, Rector said.

The Model 1500 includes an expansion slot for an additional processor, as well as five Extended Industry Standard Architecture (EISA) adapter slots and two Peripheral Component Interconnect (PCI) card slots. The server can attach to Ethernet or token-ring nets.

The system — which competes with Hewlett-Packard Co.'s NetServer LF 5/66, Dell Computer Corp.'s SP 5/90 and AST Research, Inc.'s Manhattan 5/90 servers — can run network operating systems

See **Compaq**, *page 78*

PacBell seeks to stop hemorrhaging of 800 business

BY DAVID ROHDE

Washington, D.C.

Pacific Bell, in danger of losing most of its existing 800-service business, has asked the Department of Justice to recommend that the local carrier be allowed to carry all inbound 800 calls for California phone customers.

The request, which would let Pacific Bell carry 800 calls originating anywhere in North America so long as they are terminated in California, comes in response to an alarming decline in the carrier's inregion toll-free calls (see graphic).

Long-distance carriers are grabbing calls falling entirely within California's 10 local access and transport areas by taking advantage of 800-routing practices that ignore LATA boundaries and focus on identifying a single carrier assigned to each 800 number, Pacific Bell alleged in its request for a waiver to the Modified Final Judgment.

Because this primary carrier is usually a long-distance company, the waiver request argues, Pacific Bell not only is shut out from the inter-LATA 800 market, but also now carries only one in five intra-LATA 800 calls.

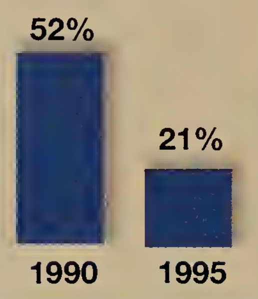
To stem the tide, Pacific Bell earlier tried to offer so-called complementary 800 service in conjunction with interexchange carriers, according to an affidavit by Pacific Bell President David Dorman filed with the waiver request.

"During the last few years, we have made thousands of referrals of customers to the complementary carrier these customers selected, only to find that in

See **PacBell**, *page 79*

A losing record at home

Pacific Bell's declining share of 800-service minutes carried within California.



THE BATTLE CONTINUES

Do I hear $5 billion?

As bidding rose past $4.9 billion last Thursday, it became too rich for some bidders' blood. Only 23 of the original 30 bidders remained, as failure to bid on a sufficient number of licenses disqualified the others. AT&T came on strong with new top bids in the Chicago and Washington, D.C.-Baltimore blocks.

Shown are the high bidders for each of the two available 30-MHz blocks in each of the 10 largest markets offered by the FCC. Three markets - New York, Southern California and Washington, D.C.-Baltimore - each have only one block available due to an earlier award.

PCS AUCTION *update*

Round 69, Thursday, Feb. 9

Region	Bidder	Bid (in millions)
New York	Craig McCaw	$348.9
Southern California	Pacific Telesis	$330.0
Chicago	AT&T	$330.8
	PCS Primeco	$321.3
San Francisco Bay Area	WirelessCo	$123.4
	Pacific Telesis	$132.0
Detroit	AT&T	$81.2
	WirelessCo	$78.1
North Carolina	AT&T	$66.6
	BellSouth	$70.9
Dallas-Fort Worth	WirelessCo	$62.1
	PCS Primeco	$68.6
Boston-Providence	AT&T	$121.7
	WirelessCo	$127.1
Philadelphia	AT&T	$81.0
	PhillieCo, L.P.	$85.0
Washington-Baltimore	AT&T	$143.3

PCS Primeco = NYNEX, Bell Atlantic, US WEST and AirTouch Communications
WirelessCo = Sprint plus three CATV companies

PeerLogic, IBM unite to ease object-based apps development

BY BARB COLE

San Francisco

PeerLogic, Inc. and IBM this week will announce plans to integrate IBM's Distributed System Object Model (DSOM) development environment with PeerLogic's message-oriented middleware to ease development of distributed, object applications.

DSOM lets developers and software vendors build programs that support the Object Management Group's Common Object Request Broker Architecture specification and distribute them across networks.

PeerLogic Pipes manages communication between application objects by routing messages across a network. It also provides a full set of operating system services.

Analysts applauded the move and said other object vendors will likely follow suit.

"It's important to have object

See **PeerLogic**, *page 77*

Company miniprofile

Based:
San Francisco
Founded:
1986
Employees:
16
Ownership:
Privately held
Primary products:
Pipes Platform, a message-oriented middleware system that lets client/server and object-oriented applications interoperate across disparate network protocols
Key competitors:
Covia, IBM and Momentum

PeerLogic

New tool simplifies the design of data warehouses

BY BARB COLE

Woodcliff Lake, N.J.

Computer Systems Advisers, Inc. (CSA) this week will roll out a tool designed to let teams of developers build and store data models that can be used to generate networked applications or design data warehouses.

The data models, which are like blueprints, are kept in a repository that acts as a central hub for designing client/server applications.

Developers may use the data models to generate applications using several front-end tools, such as Gupta Corp.'s SQLWindows and Powersoft Corp.'s PowerBuilder.

DATA EXTRACTION

In addition, they can extract data from several relational databases to develop a schema or framework for a data warehouse.

Silverrun-Enterprise is an extension of the company's existing Silverrun tool. The Enterprise version stores models in a server-based repository that resides on Oracle Corp. databases and allows several developers to work on the models simultaneously. Developers may also check models out of the database to work on them off-line at their desktops.

Analysis and design tools such as Silverrun-Enterprise reduce the maintenance involved in client/server applications, analysts said.

"This can play a big role for people who want to share information across multiple development tools. It is also well-positioned for data warehouse modeling because of the broad range of technologies it works with," said Peggy Ledvina, program director at META Group, Inc. in Reston, Va.

Anthony DeTaranto, president of CSA, said Silverrun-Enterprise is designed to minimize network traffic by allowing developers to bring down "sub-models" using Oracle's SQLNet middleware, as opposed to dragging entire data models across the network.

"We are a big user of Oracle and already have a license for SQLNet, so it will be an efficient way to access our back-end repository," said Anne Newcomb, manager of the data architecture group at Northern Telecom, Ltd. in Toronto, a beta tester of Silverrun-Enterprise.

Silverrun-Enterprise runs on Microsoft Windows, IBM OS/2 and Apple Macintosh clients. The repository can run on any platform on which Oracle databases run. The first module of Silverrun-Enterprise, the Relational Data Modeler, will be available in March for the introductory price of $4,000 per user. By May, the firm will ship a version that supports Sybase, Inc. databases and the Microsoft Corp. Open Database Connectivity protocol.

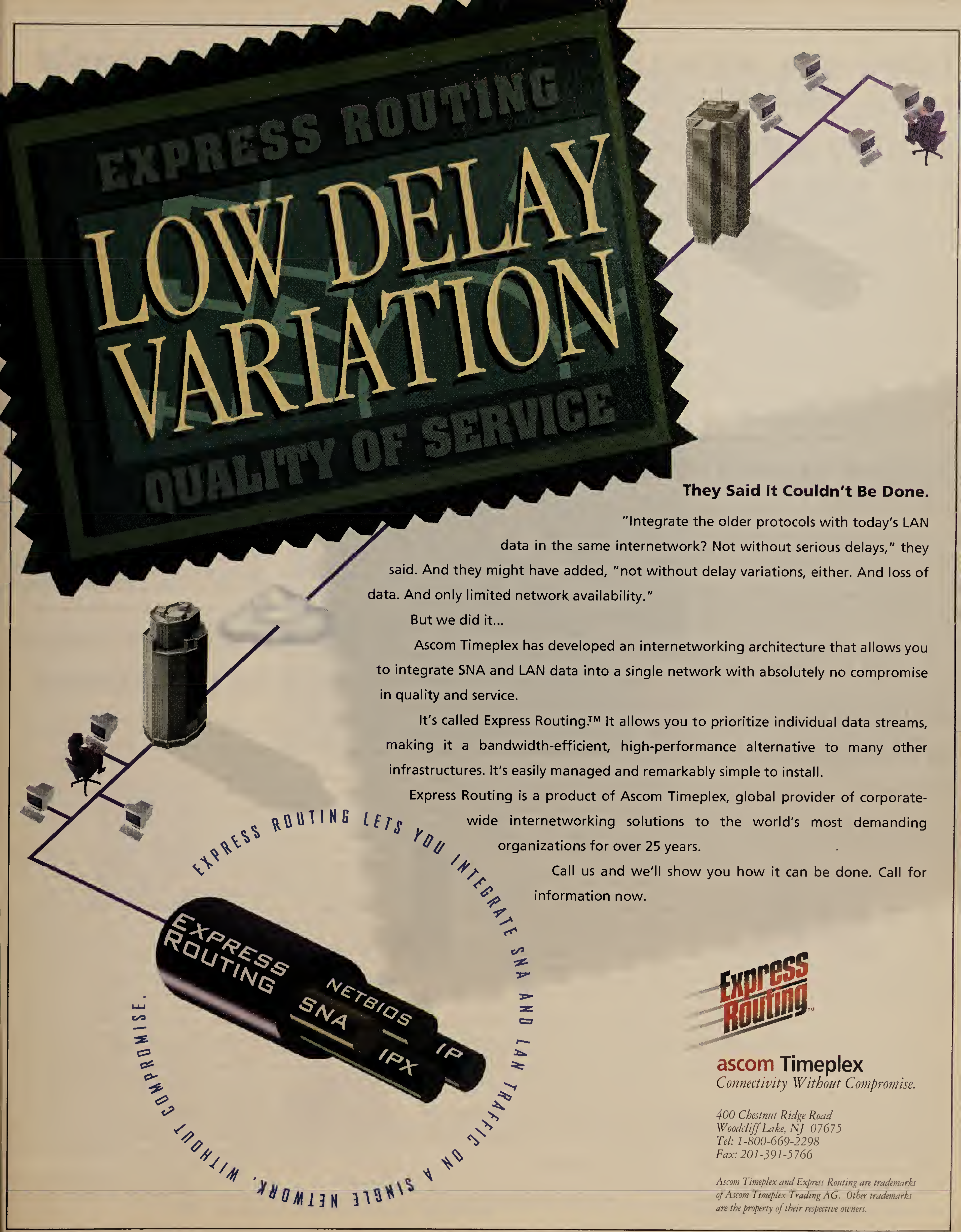
Three more modules — Business Process Modeler, Data Flow Diagrammer and Entity Relationship Expert — will be available later this year.

©CSA: (201) 391-6500.

CORRECTIONS

Due to a reporting error, *Network World* incorrectly stated the platform needed to run Microsoft Corp.'s planned Exchange Server (Jan. 30, page 1). The software will run on Windows NT.

An incorrect phone number was given for Cadre Technologies, Inc. (Feb. 6, page 25). The correct number is (401) 351-5950.



They Said It Couldn't Be Done.

"Integrate the older protocols with today's LAN data in the same internetwork? Not without serious delays," they said. And they might have added, "not without delay variations, either. And loss of data. And only limited network availability."

But we did it...

Ascom Timeplex has developed an internetworking architecture that allows you to integrate SNA and LAN data into a single network with absolutely no compromise in quality and service.

It's called Express Routing.™ It allows you to prioritize individual data streams, making it a bandwidth-efficient, high-performance alternative to many other infrastructures. It's easily managed and remarkably simple to install.

Express Routing is a product of Ascom Timeplex, global provider of corporate-wide internetworking solutions to the world's most demanding organizations for over 25 years.

Call us and we'll show you how it can be done. Call for information now.

ascom Timeplex
Connectivity Without Compromise.

400 Chestnut Ridge Road
Woodcliff Lake, NJ 07675
Tel: 1-800-669-2298
Fax: 201-391-5766

Ascom Timeplex and Express Routing are trademarks of Ascom Timeplex Trading AG. Other trademarks are the property of their respective owners.

Circle Reader Service #**28**

Cabletron has wild card in high-stakes switching game

BY JIM DUFFY

Newton, Mass.

Cabletron Systems, Inc. may have a secret weapon in the fight for switched internetworking superiority: a sophisticated network management system.

Under Cabletron's Synthesis strategy, network management plays a vital part along with Asynchronous Transfer Mode and virtual LAN technologies. Cabletron's Spectrum manager will ensure smooth operations by managing virtual LAN connections, enforcing access policies and providing accounting and security services, Cabletron officials said.

Synthesis details how the company will migrate customers from shared-media LANs and LAN internetworks to switched networks. It was announced, as expected, last week (*NW*, Feb. 6, page 4).

While management is important in today's shared-media networks, it will loom even larger in the switched world of the future because many network connections will be logical, not physical. Users will need an easier way to set up and administer systems that may be widely separated but part of the same virtual workgroup or LAN segment.

SKUBISZ

Users and analysts believe Cabletron's experience in developing the sophisticated Spectrum platform could give the hub vendor a leg up on competitors Bay Networks, Inc., Cisco Systems, Inc. and 3Com Corp. in getting customers to buy into its switching vision.

"If there's an advantage that [Cabletron] has over folks like Cisco and Fore Systems, it's that they have a much more mature set of management applications," said Val Sribar, senior WAN analyst at META Group, Inc. in Reston, Va. "They understand a lot more of the management picture, and that's a big differentiator."

Cisco and Fore do not develop management platforms but instead provide applications for router and

See Cabletron, *page 77*

Xylogics expands remote access lines

BY MICHAEL CSENGER

Burlington, Mass.

Xylogics, Inc. this week will introduce two new members of its Annex dial-up router family that give remote LANs as well as individual users access to corporate net resources.

The Remote Annex 2000 and 4000 retain their LAN-to-LAN dial-up pedigree while supporting eight to 72 individual remote users over standard modem lines.

For access to departmental or small corporate LANs, the Remote Annex 2000 supports eight or 16 ports. The Remote Annex 4000 is a larger enterprise model scalable from 18 to 72 ports. Each port can support a single user or an Ethernet LAN connection.

The Remote Annex family differs from many access servers because it supports multiuser mainframe and minicomputer systems. While some users are dialing in to router-based LANs, others can simultaneously access Digital Equipment Corp. Local Area Transport or IBM TN3270-based applications.

"We've found that over 50 percent of all remote users need access to multiuser systems, which usually

See Xylogics, *page 79*

Borland shows off Delphi tool

BY VANCE McCARTHY

Palm Springs, Calif.

A beleaguered Borland International, Inc. next month plans to ship its Delphi object-oriented application development tool, software designed to make building even the most complex distributed client/server applications easier.

Delphi, which has been in trials for almost a year among about 5,000 corporate and commercial developers, was demonstrated during last week's Demo '95 conference here and is expected to be officially announced on Feb. 14.

Based on Pascal rather than C++, Delphi will cut development time by more than seven times for even the most complicated distributed client/server applications, said Philippe Kahn, Borland's chief executive officer.

Specifically, it allows developers to assemble, rather than write, applications using simple drag-and-drop techniques that rely on a component library of tools and features. This approach allows developers to use standard reusable objects or build their own.

Delphi, which will ship next month in both standalone personal computer and client/server versions, is designed to provide developers of complicated client/server applications a highly intuitive and powerful alternative to Powersoft Corp.'s PowerBuilder and Microsoft Corp.'s upcoming Visual Basic 4.

"We worked hard to make sure this environment will provide an uncompromised rapid application development [environment]," said Karen Frederickson, Borland's vice president for client/server tools.

One key element is Delphi's native compiler, which can automatically assemble code into finished applications at a rate of 120,000 lines per minute, officials said. The compiler also includes an automatic "make" facility so that as applications are changed, only the new parts need to be recompiled. It also eliminates the need for run-time interpreter Data Link Layers for distributed applications across multiple desktops and servers throughout an enterprise network.

Delphi also includes native SQL support for Oracle Corp. and Sybase, Inc. databases and lets developers work in teams on separate parts of an application simultaneously.

Borland officials concede that the firm still has much work to do to convince users taking a wait-and-see approach to the tool, so within three months of Delphi's release, Borland intends to offer some added enticements for users of other vendors' popular tools.

In particular, the company is working with Brainstorm Technologies, Inc. of Cambridge, Mass., to turn Delphi into a front-end visual development tool for Lotus Development Corp.'s Lotus Notes. The product, currently dubbed Delphi/Notes Link, will ship by midyear, Frederickson said.

Although Borland did not announce pricing, Frederickson said the Delphi client/server version would be "very competitive" with PowerBuilder, at well below $3,900.

Borland: (408) 438-8400.

➡ McCarthy is a freelance technology writer in Foster City, Calif.

FCC drops controversial spectrum sell-off plan

BY ELLEN MESSMER

Washington, D.C.

The Federal Communications Commission last week backed down from a plan to auction off the 2.4-GHz shared radio spectrum, a move that was hailed by vendors and users of wireless LANs and other equipment who were spared eviction from the frequencies.

In October, FCC Chairman Reed Hundt advocated auctioning off the 2.4-GHz spectrum used on an unlicensed basis under the agency's so-called Part 15 rules. But pressure from a broad coalition of equipment manufacturers — and some behind-the-scenes prodding from the White House — quashed the sell-off.

The FCC even threw in 10 MHz more of new unlicensed spectrum for use by data communications devices, largely in answer to a plea made by Apple Computer, Inc.

"We're gratified by the FCC's decision," said Henrietta Wright, attorney for the Part 15 Coalition, a group of more than 50 equipment manufacturers that led the fight to preserve the free spectrum.

But things weren't wrapped up so neatly in a skirmish over another Part 15 shared band, the 902- to 928-MHz band where wireless equipment makers are contending with automated vehicle location (AVL) services. There, the FCC decided to auction off the spectrum for AVL use while still allowing wireless equipment to operate there, establishing an uneasy truce that may be broken by technical problems.

The FCC, under pressure from Sen.

See Spectrum, *page 80*

Moving ahead

Other proposals issued by the FCC last week:

Proposal	Impact
Establish separate price-cap basket for video dial-tone services.	Prohibit LECs from raising prices on voice and data services to pay for video projects.
End FCC's role in testing computers and peripherals for radio interference; substitute private testing.	Reduce testing time from an average of 77 days to 14 days; save computer industry $250 million a year.
Simplify FCC rules on so-called ex parte presentations.	Make it easier for individuals and groups to meet with FCC commissioners and staff.

Vendors ready new wares for users on the Internet

BY VANCE McCARTHY

Palm Springs, Calif.

The Internet scramble will go into high gear over the next several months, as software developers and on-line service providers roll out smarter browsers, more convenient World-Wide Web tools and low-cost — even free — goods.

During this week's Demo '95 here, a parade of well-known and not-so-well-known firms showed early versions of Internet products they expect to offer in the next six months.

At the show:

■ Architext Software demonstrated a high-performance search engine for Internet Web services that goes beyond conventional key word searches. The client/server engine — built to work on any Unix-based Web server with any Internet browser — finds and retrieves files and documents related to the original key word search, even if the exact word does not appear in the original document, officials said.

"All I can say is that, in general, we're using a type of two-phase search that first finds all documents that match the search and then gets a context from that search and compares that to other documents," said Joe Kraus, Architext's president.

For broad searches that can generate hundreds of documents, the engine will help users navigate the retrieved document by building a list of the most frequent subject areas.

Pricing for the engine, slated to ship this month, has not been determined, but it may start as low as $1,000.

Architext also hopes to ship a Windows NT Web server version later this year.

■ On-line service provider America Online (AOL) unveiled its Booklink engine, which will be embeded in the next version of its client software.

The firm plans to ship its integrated AOL/Booklink browser, an upgrade for Windows users, in April. The new front end is designed to let users build intuitive files for Internet bookmarks. A Macintosh version is due in November.

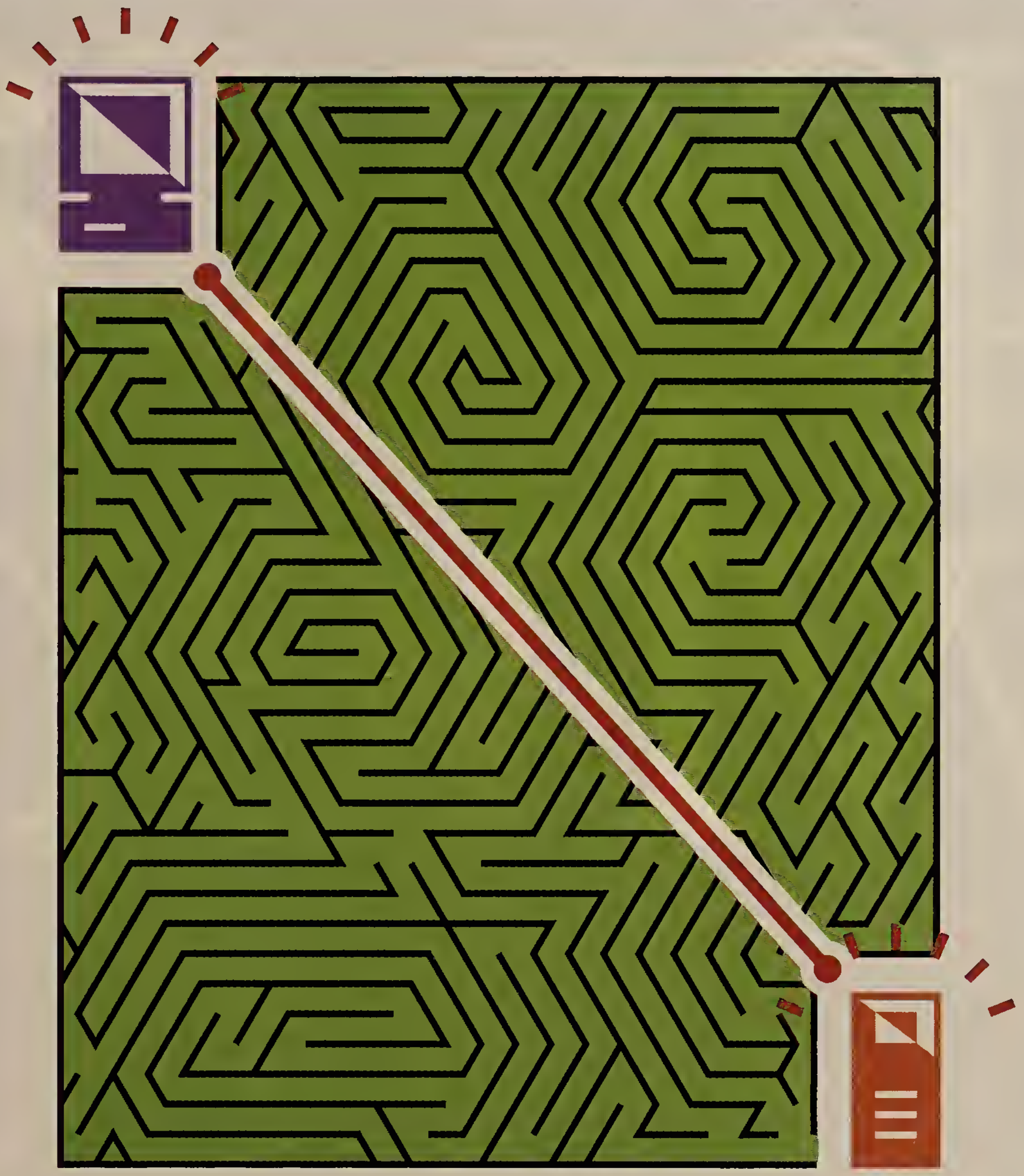
■ No Hands Software, Inc. has designed its Common Ground publishing environment to let Web users get files in their original camera-ready format, rather than in the familiar black-and-blue Internet scripting associated with Hypertext Markup Language (HTML).

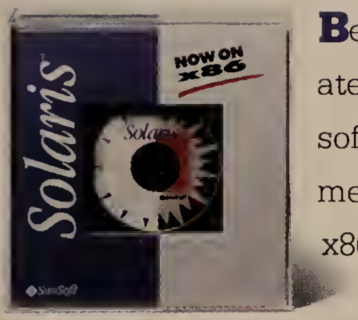
No Hands lets users of page layout programs and conventional word processors publish documents on the Web with hot links in their original format.

The product is due later this month for $189.

☎ Architext: (408) 973-8241; AOL: (703) 448-8700; No Hands: (415) 802-5800.

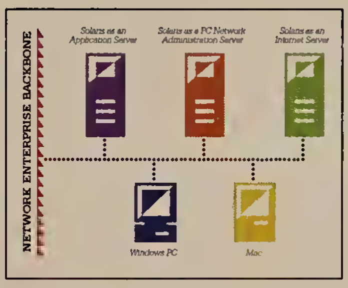
FRANKLY, WE HAVE NO IDEA WHY PC TO ENTERPRISE DATABASE ACCESS IS SO HARD.



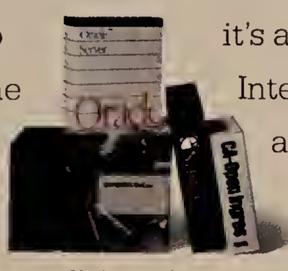


Solaris can make friends with virtually any database.

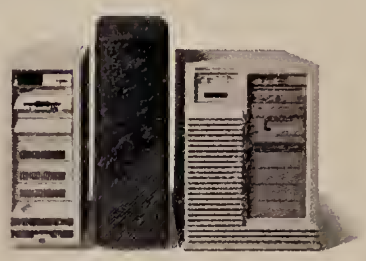
Because we created the ultimate software environment—Solaris™ x86. **N**ow you can get everything your heart, and your enterprise, desires. **L**ike built-in scalability, multithreading, increased security and well-proven reliability—whether you're running on Pentium™ or x86 platforms. The ability to run the largest databases in the world—like Informix®, Sybase®, Oracle®, Progress® and CA-Ingres®—at truly impressive speeds. And since Solaris distributes database applications evenly across all processors in a system, you won't be facing costly software rewrites. **B**ut Solaris isn't satisfied with just being the top database server—it's also a centralized server for full Internet access and a fully functional application server solution as well. From Novell® networks to Microsoft® Windows applications, Solaris offers Windows users seamless Internet and application access from anywhere on the corporate network. **S**o if you need a strong, dependable database, application or Internet server, then you need Solaris. **F**or more information, reach us at 1-800-SUN-SOFT, or via the Internet at http://www.sun.com/ **S**ee—that wasn't so hard now, was it?


NETWORK ENTERPRISE BACKBONE
Solaris as an Application Server
Solaris as a PC Network Administration Server
Solaris as an Internet Server
Windows PC
Mac

With Solaris as your application/ database, Internet, or PC network administration server, your Windows clients and NetWare® servers will have high performance access.



If it's popular, Solaris probably runs it.



Solaris improves the performance of your x86 server.

SunSoft

© 1995 Sun Microsystems, Inc. Sun, SunSoft, the SunSoft logo, and Solaris are trademarks or registered trademarks of Sun Microsystems, Inc. All other products or services mentioned herein are trademarks of their respective owners.

©1994 Hewlett-Packard Company. All rights reserved.

Introducing PowerWise from HP: the intelligent UPS designed specifically for networks.

The problem with disasters is that you just never know when they're going to strike next. That's why you need to protect your network from the apocalyptic effects power disturbances can have on both equipment *and* data. Our new PowerWise family of uninterruptible power supplies can help you do just that. By providing the reliability of continuous line conditioning, PowerWise guards against data loss and network damage due to power sags, surges, spikes, line noise, brownouts, and blackouts. As the true network UPS, PowerWise offers integrated SNMP-based network connectivity, the flexibility to grow with your needs, and the industry's most advanced shutdown software–enabling you to easily manage your UPS from anywhere on the network, even during extended outages. So call us at **1-800-533-1333, extension 9036** for all the details on the PowerWise family of intelligent UPS solutions. And defend your network from whatever's out there, whenever it decides to turn up.

HEWLETT®
PACKARD

Apple readies data-sharing, videoconferencing packages

ELLEN MESSMER

Cupertino, Calif.

Apple Computer, Inc. this summer will begin shipping standards-based videoconferencing and data-sharing packages for use by Power Macintosh users over LANs and WANs.

Not only will the new offerings support communications among Macintosh users, but some of them will also let Macintosh users communicate with other standards-based videoconferencing systems.

Apple is implementing the H.320 standard for videoconferencing and vows to support T.120, a new data-sharing standard to be ratified in March (see story, this page).

The Apple Media Conference Kit for Macintosh supports point-to-point video, one-way multicasting and data sharing across AppleTalk LANs, TCP/IP and X.25 by packetizing the picturestreams from a software-based coder/decoder based on H.261, part of the H.320 standard suite. Despite that standard support, the kit also relies on Apple's proprietary QuickTime Conferencing audio technology, Movietalk, which prevents communication between Macintosh and H.320 video systems.

H.320 originally was designed for use over ISDN and other switched services; the lack of an international standard for packetized H.320 audio and video has challenged all videoconferencing equipment makers.

To overcome the connectivity limitations of its basic conferencing kit, Apple also will offer the Apple Media Conference Pro Kit, which will be based on an H.320 codec/ISDN adapter card. This will let users dial out to reach any H.320-compliant videoconferencing system via ISDN or packetize the H.320 streams for transport over LANs and WANs.

Setting up a network call for both data sharing and videoconferencing is done by clicking on a name entry in Apple's address book application. "The system automatically reconfigures itself to use the appropriate network protocols," said Ramiro Calvo, Apple's engineering manager.

Elliot Gold, an analyst with Altadena, Calif.-based TeleSpan Publishing, Inc., said beta versions of Apple's videoconferencing and data-sharing technology deliver good quality, even on a LAN, at up to 30 frame/sec. He noted that there are a handful of other desktop video kits for the Macintosh already on the market, such as one from Compression Labs, Inc.

©Apple: (408) 974-5233.

Router support

One-way video multicasting is most efficiently done with the help of a router. Cisco will be adding multicast support as a free router upgrade this summer.

Conferencing collection

Product	Components	Price
Apple Media Conference Kit for Macintosh	QuickTime Conferencing operating system extension, H.261 software-based codec, Apple Media Conference data-sharing software and video camera	$200
Complete Media Conferencing System	Apple Media Conference Kit, Macintosh computer and external speakers	$6,000
Apple Media Conference Pro Kit	Apple Media Conference Kit and H.320 codec/ISDN adapter board for full-screen standards-based videoconferencing	$1,750

Note: All packages are due this summer.

Microsoft's data-sharing call

Microsoft Corp. last week threw its weight behind the T.120 data conferencing standard, promising products in the future that let users remotely share applications in real time.

In the fight that divides the industry on how to implement T.120 on LANs, Microsoft cast its vote for a proposal put forward by DataBeam Corp., rather than a competing one from Intel Corp.

"Microsoft has taken the standards-first position, that you need to use the standards established by the International Telecommunication Union," said Blake Irving, group manager for Microsoft's Personal Systems Division.

All sides agree that extensions will be needed for T.120 to support data conferencing over TCP/IP, LANs and proprietary networks – areas outside the ITU's purview. But the Intel-led Personal Conferencing Work Group – which is addressing such extensions – only has included a small portion of T.120 in the specification that it released one month ago, Blake said.

DataBeam, along with AT&T, BT, PictureTel Corp. and Polycom, Inc., has played a key role over the years in developing T.120. All of these vendors are members of an industry group called the International Multimedia Teleconferencing Consortium (IMTC) that addresses interoperability issues and is exploring T.120 extensions. (Membership between the Intel group and IMTC overlaps considerably).

The first T.120-based products from Microsoft will appear well after Windows 95 ships in August, Blake said.

"We see T.120 playing an important role in customer communications in the future," he said. "For instance, a product support person could share the file manager application with a customer having a problem, both looking at it at the same time."

BY ELLEN MESSMER

PARALLEL PROCESSING

IBM introduces faster and more powerful Unix servers

BY MICHAEL COONEY

Somers, N.Y.

IBM last week filled out the high end of its Unix-based server family, giving users a hefty performance boost from two new platforms.

The new models include four new parallel processing PowerParallel SP2s, which are 40% faster than existing models, and the new RISC System/6000 Model 39H, which is 25% more powerful than existing IBM Unix servers.

IBM also added to the suite of software that will run on the PowerPC-based SP2 platform with support for AIX High Availability Cluster Multiprocessing/6000 (HACMP/6000) clustering software and NetView for AIX.

"With the power of the SP2 and the new clustering capabilities, users get a new, more reliable class of servers they can use to build bigger, more open networks," said Anura Guruge, an independent analyst in New Ipswich, N.H.

Once used mainly in supercomputing or scientific applications, SP2 is now being touted by IBM as a powerful business server platform.

"Ultimately, we expect that 70% of SP2 server sales will come from the commercial business users," said Ben Barnes, IBM vice president of worldwide PowerParallel marketing.

All four of the new SP2s – Models 204, 304, 404 and 3A4 – are built on IBM's 66-MHz PowerPC Thin Node 2 chip and run IBM's AIX operating system.

The four models can support a variety of communications adapters, from Fiber Distributed Data Interface, Token Ring and Ethernet to IBM's Turboways 100M bit/sec Asynchronous Transfer Mode.

For users that need connectivity to a mainframe, they also support Block Multiplexer Channel or Enterprise Systems Connection (ESCON) adapters.

The adapters fit in "nodes" that are installed inside SP2. Each node supports two to four adapters, depending on the media type. Users can mix and match adapters as needed. For example, the base Model 204 supports two nodes, which means as many as eight FDDI or Token-Ring adapters, six Ethernet, two TurboWays, two ESCON or four Block Multiplexer Channel connections.

The Model 204 can be expanded to support as many as seven nodes, while the Model 304 supports 80 nodes and the Model 404 up to 128 nodes.

The new HACMP/6000 software will let users lash together as many as eight SP2s in a cluster. Previously only available on the RS/6000 line, the software now lets users distribute application processing workloads among the eight processors. It also automatically switches workloads from one server to another in the event of a failure.

Porting NetView for AIX to the SP2 is likewise part of IBM's effort to push the platform into business settings. Two key management applications – Trouble Ticket for AIX and Systems Monitor for AIX – will be ported along with the underlying platform.

IBM executives said SP2 would help the NetView for AIX platform perform better but would not increase the number of users or objects it supports. Future versions will exploit the SP2 further, they said.

"As users move to larger networks that have lots of events to track, they need the muscle power and scalability of the SP2," Guruge said. "IBM has talked about running NetView for AIX on more powerful platforms for a couple years. Now they appear to be delivering it."

"IBM has talked about running NetView for AIX on more powerful platforms for a couple years. Now they appear to be delivering it," Guruge said.

The new SP2 models will be available March 3, with pricing starting at $127,000.

The new RS/6000 Model 39H is now IBM's top-of-the-line Unix server. Running a 67-MHz Power2 processor, the new server includes 64M bytes of memory, 2G bytes of disk storage – expandable to 13.5G bytes – and an integrated Small Computer System Interface-2 controller. It also includes an integrated Ethernet adapter and room for four other LAN adapters, in addition to two serial and one parallel port.

The Model 39H will be available Feb. 17 priced at $41,900. HACMP/6000 for SP2 and Model 39H will be available March 31 for $8,000 per node.

©IBM: (800) 426-2255.

INTERNET *tip*

BY ADAM GAFFIN

ISDN items

"Dan Kegel's ISDN Page" is a Web resource devoted to the dial-up telecommunications service. Resources include:

- ✓ **Answers to basic ISDN questions**
- ✓ **Lists of service, hardware and software vendors**
- ✓ **Links to ISDN-related databases and discussions**

To access: Point your Web browser at http://alumni.caltech.edu/~dank/isdn/ and follow the links.

Gaffin can be reached via the Internet at agaffin@world.std.com.

SIEMENS
ROLM Communications

©1995 SIEMENS ROLM COMMUNICATIONS INC. ROLM IS A REGISTERED TRADEMARK OF SIEMENS ROLM COMMUNICATIONS INC.

The traditional office as we know it is coming apart at the seams. Sales teams are on the road. Managers are working off-site. And more and more of the workforce is telecommuting. But with ROLM virtual office solutions, this transition can be transparent. ROLM virtual office solutions break down the barriers of time, distance and information access. So your employees work together and respond to customer needs no matter where they are. From intelligent voice mail that can place calls to employees on their car phones to wireless capabilities and worldwide fax, we can help your team reach new heights of teamwork. Call for our white paper on how we can break down the walls to create the virtual office and improve your information infrastructure. Not to mention how to close the gap between where you are and where you want to be.

ROLM RESULTS: BRINGING WORKGROUPS TOGETHER

YOUR PHONE SYSTEM. IT COULD BE THE MOST POWERFUL TOOL IN YOUR COMPANY.

FOR MORE INFORMATION, GIVE US A CALL AT 1-800-ROLM-123, EXT. 54.

Circle Reader Service **#42**

The quickest way to keep Compaq® communicating with Dell

* For an IBM Authorized Business Partner near you or for copies of IBM's Statement of Limited Warranty, call 1 800 772-2227. Warranty available upon request. This warranty is not transferable by end user/customer. Refer to minimum system requirements. Some configurations may not be compatible. Product availability may vary. IBM is a registered trademark and Options by IBM and There is a difference are trademarks of International Business Machines Corporation. All other products and/or company names are trademarks or registered trademarks of their respective companies. © 1995 IBM Corporation.

This is the IBM Auto 16/4 Token-Ring ISA Adapter, and it not only works with virtually any PC on your LAN, it has features that get you up and running in minutes, at a price you flat-out won't believe.

For example, since it's Plug 'n' Play enabled, our adapter configures itself automatically on Plug 'n' Play systems, both at installation and later on if something changes. Also, you'll never have to set switches for ring speed or cable type again. Plus, it has handy LED status indicators, and it's full duplex enabled, more than fast enough for multimedia.

And the price? Well, let's just say we took an ax to our old price and lopped it off not too far above the middle. You get the idea.

To learn more about the Options by IBM™ Token-Ring Adapter, call 1 800 IBM-4FAX and key in ID# 1842. To order, see your IBM Authorized Business Partner.*

The IBM Auto 16/4 Token-Ring ISA Adapter. For Dell, for Compaq, for Gateway 2000®, for IBM, for peanuts.

s with the easy-installing **Token-Ring** *Adapter from IBM.*

IBM Auto 16/4 Token-Ring ISA Adapter.

Easy to install. True Plug 'n' Play software simplifies setup.

Easy to manage. Configures for ring speed (4 or 16 Mbps) and cable type (UTP or STP) automatically.

Easy to live with. Full duplex enabled, it can double the effective bandwidth for users.

Easy to pay for. New pricing is very competitive.

Compatibility tested.

Lifetime warranty for as long as you own it.

There is a difference™ IBM®

Global expertise in high-speed wide area networking

Stay public? Go private? Opt for the latter and the commitment becomes real. So pick your partner carefully. Our customers did. And we're it. Because we deliver in private where others fall short. Future-proofed. Smart-priced. High-speed WANs. FastPADs.™ IPX.® BPX.™ What you want today. With plug-in scalability for seamless migration to hybrid networks tomorrow.

We install the best private high-speed WANs in the world. And more of them. You want to talk in private? Talk to us.

STRATACOM®
THE FASTPACKET COMPANY™

1-800-537-7707

©1995 StrataCom, Inc. StrataCom and IPX are registered trademarks and FastPAD, BPX and The FastPacket Company are trademarks of StrataCom, Inc

Circle Reader Service # **44**

Networld+Interop
Las Vegas, March 29-3
Booth 2368

Application for FREE Subscription

☐ **YES!** I want to receive my **FREE** subscription to NETWORK WORLD.

☐ No. Thank You.

Sign Here

X ______________________________
Signature Date

To Qualify: You must supply your company name and address.

Name ______________________________
Title ______________________________
Company ______________________________
Address ______________________________
City ______________________ State ______ ZIP ______
Business Phone (________) ______________________
Business FAX (________) ______________________

NETWORK WORLD

The Newsweekly of Enterprise Network Computing

☐ My home address is also my business address.

Optional Delivery Address:
Enter your home address below if your company will not accept delivery at your business address:

____
Street Address City State Zip

If military, please specify branch and base: ______________________________

If government, please specify division: ______________________________

1 Industry: (check one only)

- 01. ☐ Manufacturers (other)
- 02. ☐ Finance/Banking
- 03. ☐ Insurance/Real Estate/Legal
- 04. ☐ Healthcare Services
- 05. ☐ Hospitality/Entertainment/ Recreation
- 06. ☐ Media/TV/Cable/Radio/Print
- 07. ☐ Retail/Wholesale Trade/Business Services
- 08. ☐ Transportation
- 09. ☐ Utilities
- 10. ☐ Education
- 11. ☐ Process Industries (Mining/Construction/ Petroleum Refining/ Agriculture/Forestry)
- 12. ☐ Government Federal/State/Local
- 13. ☐ Military
- 14. ☐ Aerospace
- 15. ☐ Consultants (Independent)
- 16. ☐ Carriers/Interconnects
- 17. ☐ Manufacturers (Computer/ Communications)
- 18. ☐ Systems/Network Integrators (VAR/VAD/ VAN/Systems/Software Houses)
- 19. ☐ Distributors Communications/ Computers
- 20. ☐ Other________________

2 What is your Job Function? (check one only)

NETWORK IS Management:

- 1. ☐ Networking Management
- 2. ☐ LAN Management
- 3. ☐ Datacom/Telecom Management
- 4. ☐ IS,IT,MIS,Systems Management
- 5. ☐ Engineering Management
- 6. ☐ Corporate Management (CIO,CEO,PRES,VP, DIR,MGR,Financial Management)
- 7. ☐ Consultant (Independent)
- 8. ☐ Other________________

3 What is the total number of sites for which you have purchase influence? (check one only)

- 1. ☐ 100+
- 2. ☐ 59 - 99
- 3. ☐ 20 - 49
- 4 ☐ 10 - 19
- 5. ☐ 2 - 9
- 6. ☐ 1
- 7. ☐ None

4 What is your scope and involvement in purchasing decisions for network products & services for your enterprise?

A. SCOPE (check one only)

- 1. ☐ Corporatewide
- 2. ☐ Multienterprise
- 3. ☐ Departmental
- 4. ☐ None

B. INVOLVEMENT (check all that apply)

- 1. ☐ Recommend/Specify
- 2. ☐ Approve
- 3. ☐ Evaluate
- 4. ☐ Determine the need
- 5. ☐ None

5 Check ALL that apply in columns A and B:

A: I am involved in the purchase of the following products/services.
B: I plan to purchase the following products/services.

A B
☐ 100 ☐ **LOCAL AREA NETWORKS**
☐ 01. ☐ Local Area Networks
☐ 02. ☐ Network Operating Systems Software (NOS)
☐ 03. ☐ LAN Storage Devices (optical, tape, disk, etc.)
☐ 04. ☐ LAN Backup Systems (optical, tape, disk, etc.)
☐ 05. ☐ Network Test Equipment/Diagnostic/ Management Software
☐ 06. ☐ Hubs/Intelligent Hubs
☐ 07. ☐ Cables, Connectors, Baluns
☐ 08. ☐ UPS
☐ 09. ☐ Network Adapter Boards/Network Interface Cards
☐ 10. ☐ Peer-to-Peer LANs
☐ 11. ☐ Wireless Networks
☐ 12. ☐ SNMP Network Management
☐ 13 ☐ ATM Switches
☐ 14. ☐ Remote LAN Access
☐ 15. ☐ Ethernet Switches
☐ 16. ☐ LAN Servers
☐ 17. ☐ Superservers
☐ 18. ☐ Remote Access/Communications Servers

A B
☐ 101 ☐ **REMOTE/WIRELESS COMPUTING**
☐ 19. ☐ Laptops
☐ 20. ☐ Notebooks
☐ 21. ☐ PDAs
☐ 22. ☐ PCMCIA
☐ 23. ☐ Mobile Data Services
☐ 24. ☐ Wireless Data Services
☐ 25. ☐ Wireless Data Equipment

A B
☐ 102 ☐ **INTERNETWORKING**
☐ 26. ☐ Bridges
☐ 27. ☐ Routers
☐ 28. ☐ Gateways
☐ 29 ☐ Bridge/Routers

A B
☐ 103 ☐ **COMPUTERS/PERIPHERALS**
☐ 30. ☐ Micros/PCs
☐ 31. ☐ Minis
☐ 32. ☐ Mainframes
☐ 33. ☐ Workstations
☐ 34 ☐ Front-End Processors
☐ 35 ☐ Terminals
☐ 36. ☐ Printers
☐ 37. ☐ Cluster Controllers
☐ 38. ☐ Fax Machines
☐ 39 ☐ Monitors

A B
☐ 104 ☐ **SOFTWARE/APPLICATIONS**
☐ 40 ☐ Network Management
☐ 41. ☐ Systems Management
☐ 42. ☐ Micro to Mainframe
☐ 43 ☐ Security
☐ 44 ☐ Communication/Terminal Emulation
☐ 45 ☐ Word Processing
☐ 46 ☐ Operating Systems
☐ 47 ☐ Client Server Applications Development

A B **SOFTWARE/APPLICATIONS (cont'd)**
☐ 48. ☐ Applications Development
☐ 49. ☐ Data Base Management/RDBMS
☐ 50. ☐ Spreadsheet
☐ 51 ☐ Groupware
☐ 52. ☐ EDI
☐ 53. ☐ E-Mail
☐ 54. ☐ Windows/Graphical User Interface
☐ 55. ☐ 4GL Development/Case
☐ 56. ☐ Multimedia
☐ 57. ☐ Graphics/DTP
☐ 58. ☐ Remote Access
☐ 59. ☐ Imaging
☐ 60. ☐ Suites
☐ 61. ☐ Middleware
☐ 62. ☐ Document Management

A B
☐ 105 ☐ **WIDE AREA NETWORKS EQUIPMENT & SERVICES**
☐ 63. ☐ Modems (9.6K bps and over)
☐ 64. ☐ Modems (under 9 6K bps)
☐ 65. ☐ T-1/T-3 Multiplexers
☐ 66. ☐ T-1/T-3 Services
☐ 67. ☐ Inverse Multiplexers
☐ 68. ☐ Fractional T-1
☐ 69. ☐ SMDS
☐ 70. ☐ ATM (Asynchronous Transfer Mode)
☐ 71. ☐ Matrix Switches
☐ 72. ☐ Packet Switches
☐ 73. ☐ Protocol Converters
☐ 74. ☐ Diagnostic/Test Equipment
☐ 75. ☐ DSU/CSU
☐ 76. ☐ Microwave
☐ 77. ☐ Fax Boards/Modems
☐ 78. ☐ VSAT
☐ 79. ☐ Fiber Optic
☐ 80. ☐ Satellite
☐ 81. ☐ ISDN
☐ 82. ☐ PBXs (over 1000 lines)
☐ 83 ☐ PBXs (under 1000 lines)
☐ 84. ☐ Automatic Call Distributors
☐ 85. ☐ Voice Messaging Systems
☐ 86. ☐ Videoconferencing/Teleconferencing
☐ 87. ☐ Voice Response/Processing
☐ 88. ☐ Dedicated Leased Line
☐ 89. ☐ Switched Data
☐ 90. ☐ E-Mail/Online Services
☐ 91. ☐ Image Processing
☐ 92. ☐ 800/900 Services
☐ 93. ☐ WATS/MTS
☐ 94 ☐ International
☐ 95. ☐ Virtual Networks
☐ 96. ☐ Frame Relay
☐ 97. ☐ Value Added Services
☐ 98. ☐ CIT (Computer-Integrated Telephony)

☐ 99 ☐ None of the above (1-98)

6 What is the total number of LANS, Workstations/Nodes: At this Location/ In your Organization?

At This Location:	LANs		Workstations/ Nodes	Entire Organization:	LANs		Workstations/ Nodes
1.	☐	5000+	☐	1.	☐	5000+	☐
2.	☐	1,000 - 4,999	☐	2.	☐	1,000 - 4,999	☐
3.	☐	100 - 999	☐	3.	☐	100 - 999	☐
4.	☐	50 - 99	☐	4.	☐	50 - 99	☐
5.	☐	10 - 49	☐	5.	☐	10 - 49	☐
6.	☐	9 or less	☐	6.	☐	9 or less	☐
7	☐	None of the above	☐	7.	☐	None of the above	☐

7 Check ALL that apply in columns A and B:

A: The following network platforms are currently installed.
B: The following network platforms are currently planned.

A B
☐ 55 ☐ **NETWORK ARCHITECTURES**
☐ 01. ☐ SNA
☐ 02. ☐ DECNET
☐ 03. ☐ MAP/TOP
☐ 04. ☐ TCP/IP
☐ 05. ☐ DCA (Unisys)
☐ 06. ☐ X.25
☐ 07. ☐ Novell IPX/SPX
☐ 08. ☐ APPC/APPN/LU6.2
☐ 09. ☐ NETBIOS
☐ 10. ☐ OSI
☐ 11. ☐ APPLETALK
☐ 12. ☐ NSF
☐ 13. ☐ XNS
☐ 14. ☐ OTHER____________________

A B
☐ 56 ☐ **NETWORK OPERATING SYSTEM**
☐ 15. ☐ LOCALTALK (APPLETALK)
☐ 16. ☐ BANYAN (VINES)
☐ 17. ☐ DCA (IRMALAN)
☐ 18. ☐ DCA (10-NET)
☐ 19. ☐ IBM (LAN SERVER)
☐ 20. ☐ IBM (PC LAN PROGRAM)
☐ 21. ☐ MICROSOFT (LAN MANAGER)
☐ 22. ☐ NOVELL (NETWARE, 2X, 3X, 4X)
☐ 23. ☐ PROTEON (PRONET)
☐ 24. ☐ 3COM (3+, 3+OPEN)
☐ 25. ☐ ARTISOFT (LANTASTIC)
☐ 26. ☐ HAYES (LANSTEP)
☐ 27. ☐ DEC (PATHWORKS)
☐ 28. ☐ WINDOWS NT/ADVANCED SERVER
☐ 29. ☐ OTHER____________________

A B
☐ 57 ☐ **LAN ENVIRONMENT**
☐ 30. ☐ 4M TOKEN RING
☐ 31. ☐ 16M TOKEN RING
☐ 32. ☐ ARCNET
☐ 33. ☐ ETHERNET
☐ 34. ☐ 100 M ETHERNET
☐ 35. ☐ STARLAN
☐ 36. ☐ FDDI
☐ 37. ☐ LOCAL TALK
☐ 38. ☐ 10BASE-T
☐ 39. ☐ ATM
☐ 40. ☐ OTHER____________________

A B
☐ 58 ☐ **COMPUTER OPERATING SYSTEM**
☐ 41. ☐ DOS
☐ 42. ☐ UNIX/XENIX/AIX
☐ 43. ☐ OS/2
☐ 44. ☐ OS/2.X
☐ 45. ☐ IBM MVS
☐ 46. ☐ IBM VM
☐ 47. ☐ DIGITAL VMS
☐ 48. ☐ MACINTOSH
☐ 49. ☐ WINDOWS
☐ 50. ☐ WINDOWS NT
☐ 51. ☐ X WINDOWS
☐ 52. ☐ SOLARIS
☐ 53. ☐ OTHER____________________

☐ 54. ☐ None of the above (1-53)

8 For which areas outside of the U.S. do you have purchase influence? (check all that apply)

- 1. ☐ Europe
- 2. ☐ Asia
- 3. ☐ South America
- 4. ☐ Australia
- 5. ☐ Middle East
- 6. ☐ None

9 Which of the following hardware platforms are installed/planned in your company? (check all that apply)

	Mainframes		Minis			Mainframes		Minis	
	Installed	Planned	Installed	Planned		Installed	Planned	Installed	Planned
01. IBM	☐	☐	☐	☐	06. DATA GENERAL	☐	☐	☐	☐
02. DIGITAL	☐	☐	☐	☐	07. HP	☐	☐	☐	☐
03. AMDAHL	☐	☐	☐	☐	08. TANDEM	☐	☐	☐	☐
04. AT&T	☐	☐	☐	☐	09. UNISYS	☐	☐	☐	☐
05. BULL HNIS	☐	☐	☐	☐	10. OTHER________	☐	☐	☐	☐

Which of the following do you have installed/planned: (USE NUMBERS ONLY)

	At This Location		Entire Organization	
	Servers	Clients/Nodes	Servers	Clients/Nodes
11. POWER MACINTOSH				
12. MACINTOSH OTHER				
13. POWER PC BASED				
14. PENTIUM BASED				
15. 80486 BASED				
16. 80386 BASED				
17. 80286 BASED				
18. 80806/80808 BASED				
19. ALPHA BASED				
20. RISC/UNIX BASED WORKSTATIONS				
21. OTHER				

10 What is the estimated value of networking equipment and services that you help specify, recommend or approve annually? (check one only)

- 01. ☐ $100 million and over
- 02. ☐ $50 - $99.9 million
- 03 ☐ $25 - $49.9 million
- 04 ☐ $20 - $24.9 million
- 05. ☐ $10 - $19.9 million
- 06. ☐ $5 - $9.9 million
- 07. ☐ $1 - $4.9 million
- 08. ☐ $500,000 - $999,999
- 09. ☐ $499,999 or less
- 10. ☐ None of the above

11 Estimated gross annual revenues of your entire company/institution: (check one only)

- 1. ☐ Over $10 billion
- 2. ☐ $1 to $9.9 billion
- 3. ☐ $500 to $99.9 million
- 4 ☐ $100 to $499.9 million
- 5. ☐ $50 to $99.9 million
- 6. ☐ $10 to $49.9 million
- 7 ☐ $5 to $9.9 million
- 8. ☐ $4 9 million or less
- 9 ☐ None of the above

12 Estimated number of employees: At This Location/In Entire Organization.

At This Location:

- 1 ☐ Over 10,000
- 2. ☐ 5,000 - 9,999
- 3 ☐ 2,500 - 4,999
- 4 ☐ 1,000 - 2,499
- 5. ☐ 500 - 999
- 6. ☐ 499 or less

Entire Organization:

- 1 ☐ Over 10,000
- 2. ☐ 5,000 - 9,999
- 3 ☐ 2,500 - 4,999
- 4. ☐ 1,000 - 2,499
- 5. ☐ 500 - 999
- 6. ☐ 499 or less

BI295

1. FOLD HERE & MAIL TODAY

3. PLEASE TAPE HERE

2. FOLD HERE & MAIL TODAY

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO 1752 NORTHBROOK IL

POSTAGE WILL BE PAID BY ADDRESSEE

NETWORK WORLD
The Newsweekly of Enterprise Network Computing
PO BOX 3091
NORTHBROOK IL 60065-9928

CrossComm switch modules handle net mgmt.

BY JIM DUFFY

Westford, Mass.

When CrossComm Corp.'s Ethernet switching modules for its XL router line ship this quarter, they'll be equipped with management capabilities usually found in separately priced software packages.

PRIMER

The modules, which are manufactured by Applied Network Technology, Inc. (ANT) here, have embedded logic that performs many of the tasks of Simple Network Management Protocol agents, Remote Monitoring (RMON) LAN probes and segment monitors. Equipped with this management intelligence, the routers will handle, on their own, many routines that usually require human

See CrossComm, *page 18*

BRIEFS

Microsoft Corp. last week announced it has licensed **IBM's APPC Application Suite** source code for use in its **Windows NT SNA Server.** Microsoft executives said they were particularly interested in implementing the APPC File Transfer Protocol, which will enable SNA Server users to transfer gigabits of data quickly between the mainframe and Windows NT workstations. IBM sells the APPC application Suite code for $40,000.

IBM: (919) 254-6126.

IBM last week announced **VTAM Version 4 Release 2** for its **VM/ESA** and **VSE/ESA** users, which for the first time brings full Advanced Peer-to-Peer Networking support to those mainframe users.

VTAM 4.2 for VM and VSE users will be made available in three versions: VTAM Client/Server Package, for users with single VM or VSE machines; VTAM MultiDomain Package, for users with multiple VM or VSE machines; and VTAM InterEnterprise Package, for users with multiple mainframes on interconnected APPN nets.

VTAM 4.2 for VM will be available March 17. VTAM 4.2 for VSE will be available April 17. The VSE Client/Server Package starts at $171 per month. The MultiDomain Package starts at $214 a month and the InterEnterprise Package at $256.

IBM: (919) 254-6966.

Advanced Computer Communications (ACC) has added **ISDN** hardware and software enhancements to its **Amazon access routers.**

The ISDN Dual Basic Rate Interface module for ACC's Amazon supports two separate ISDN BRIs for $1,995. Enhanced software features include IPX spoofing, ISDN subaddressing and bandwidth on demand. The enhanced features will be available in 30 days.

ACC: (408) 366-9600.

StrataCom ATM and frame relay revolve around Axis

BY MICHAEL CSENGER

San Jose, Calif.

StrataCom, Inc. next week will introduce its answer for high-density, low-cost backbone network access when it announces an access shelf for the BPX Asynchronous Transfer Mode switch.

Under development for more than a year, the shelf — code-named Basis — was described last summer as an effort to less expensively provision low-speed services on a BPX-based ATM backbone.

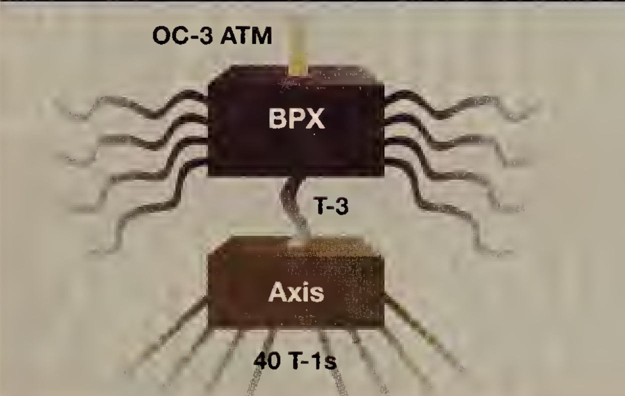
Sources familiar with the project said Basis would be an alternative to StrataCom's IPX frame relay switch, which suffers capacity limits that can make it an expensive platform for provisioning low-speed connections (*NW*, Aug. 29, 1994, page 1).

StrataCom would not discuss next week's plans, except to confirm that the product will be introduced as Axis.

While Axis lacks the switching intelligence that would let it replace StrataCom's venerable IPX product family, sources said it is likely to supplant the IPX as a low-speed feeder to the BPX.

AT&T, for example, could satisfy burgeoning demand for its InterSpan frame relay service by provisioning new customers off Axis shelves rather than IPX nodes.

StrataCom's ATM fan-out plan



Each Axis shelf supports up to 40 T-1s. Each BPX can hold up to 16 Axis shelves, enabling it to attach a total of 15,360 56K or 64K bit/sec frame relay or SMDS circuits to an ATM backbone.

GRAPHIC BY SUSAN J. CHAMPENY

"Once [Axis] comes out, AT&T will probably not need to buy more IPXs — certainly not at the rate they are now," said Christine Heckart, a consultant with TeleChoice, Inc. of Verona, N.J. "The IPX would be needed for only a very certain configuration, as a satellite node.

"Their objective was to up density and lower the price per port. And they've achieved that objective more elegantly than any other alternative so far. The approach they've used gives them probably more scalability than any other vendor," Heckart said.

Another source familiar with the product said each Axis shelf has 16 slots, 10 of them for user interface cards with four T-1 ports each. Therefore, one shelf supports 40 T-1s and feeds this aggregate to the BPX over a 45M bit/sec ATM link — the equivalent of only 28 T-1s.

"It seems to be a blocking design, which is pretty lousy," said a source who asked not be named.

But Heckart disagreed. "There are options on the backplane that allow the connection between [Axis and BPX] to be scalable," she said, although she was not sure what would be available with the initial release.

A single BPX can support up to 16 Axis shelves, giving the switch a total fan-out of more than 15,000 low-speed circuits per switch. Most frame relay connections are at 56K bit/sec or less, which is lower in speed but greater in

See StrataCom, *page 18*

Ascend adds frame relay to WAN hubs

BY MICHAEL CSENGER

Alameda, Calif.

Ascend Communications, Inc. last week announced it has added frame relay support to its line of WAN access hubs, bringing dialed services and frame relay another step closer to seamless interworking.

By combining frame relay support for Ethernet traffic with dialed access over ISDN, switched 56K bit/sec and standard modem lines, Ascend gives low-end users an upward migration path and offers larger organizations a means to connect lone offices to the corporate frame relay backbone.

Ascend announced frame relay software for its Pipeline 400 and Ascend Max access devices, and introduced a new product called Pipeline EtherFrame.

Customers typically use Pipeline 400 and Max as central-site concentrators for a mix of ISDN, switched 56 and analog modem lines, all bundled together over one to four T-1 or ISDN Primary Rate Interface links. The alternative is to administer separate modem pools, ISDN terminal adapters and data service unit/channel service unit (DSU/CSU) racks with individual access links for each service. The Ascend products also support full IP routing and can bridge other protocols.

By adding software support for frame relay, these central-site platforms now let branch offices and remote users dial up access to public or private frame relay nets. The dialed calls reach Max or Pipeline 400 as IP packets that can be routed and converted to frame relay format. A separate link then connects the central site to a frame relay net, through which the dialed call reaches its destination.

"This is an impressive announcement that starts to open interesting possibilities," said Christine Heckart, a consultant at TeleChoice, Inc. in Verona, N.J. "Frame relay is starting to move down-market."

PRICING ISSUES

Carriers have priced the service low enough for small companies to justify frame relay links where before they relied on switched 56 or modem connections, she said.

"But there are other companies in between that can justify frame relay circuits for certain sites and also need to connect their smaller offices," Heckart said. With Ascend's offering, they could be connected to a frame relay node that gives them fully meshed and routed connectivity to any other location on the net.

And for those sites that have enough traffic volume to justify leased lines, Ascend's Pipeline EtherFrame supports two 56K bit/sec frame relay links from an Ethernet router. Pipeline EtherFrame attaches to an Ethernet LAN and supports as many as four simultaneous users, each connecting to a different address. With a pair of built-in DSUs/CSUs and SNMP support, Pipeline EtherFrame is an unmatched bargain at $1,695, said Ascend cofounder Jay Duncanson.

Ascend's frame relay software, called EtherFrame, is available as a $1,000 option for Pipeline 400 and Ascend Max. Pipeline EtherFrame is a stand-alone platform that includes the EtherFrame software.

©Ascend: (510) 769-6001.

Reality ✓ Check

Product: Pipeline EtherFrame
Company: Ascend

Benefits:
- Low-cost frame relay access router for small Ethernet-based offices.
- Dual 56K bit/sec connections with integral DSUs/CSUs.
- Full IP routing functionality.
- SNMP-managed.

Drawbacks:
- Limited to leased lines – no ISDN or switched 56 support.
- Does not support legacy protocols.
- Stand-alone WAN device – no LAN routing or bridging.

The user view:
"We've been using frame relay over ISDN for about a year. We've never had a problem, except for getting the service installed and properly configured through the carriers."
Leigh Reynolds, network designer, Bloomberg Financial Services

StrataCom

Continued from page 17

demand than network planners expected. And it is this capacity problem that Axis must solve.

Sources said Axis will support T-1 frame relay, ATM and Switched Multimegabit Data Service services, including Data Exchange Interface connections for ATM and SMDS as low as 56K bit/sec. Carriers such as AT&T are an obvious target, but StrataCom's private frame relay customers also have run into capacity and cost issues when their IPX networks must grow.

John Boyd, a network manager at Northeast Utilities in Berlin, Conn., said his company's IPX-based frame relay net includes an ATM backbone core of two BPX switches.

"I saw [Axis] about a year ago and expect that it's gone through some transformations," he said. "Port density and cost are the key issues for us, so I'll see if it still has what we need."

Do not expect much more, said one source who described Axis as a simple shelf-extension module.

StrataCom has gotten the cost down from about $800 to $400 per circuit by keeping it simple. Axis must be collocated with a BPX; making it a stand-alone product would require more expensive logic and software features.

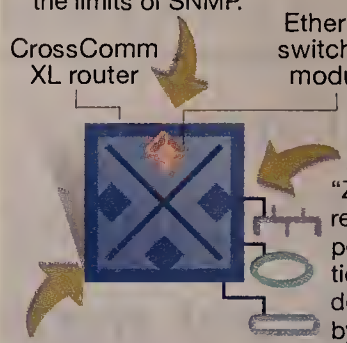
But that's all most users will need, said Rick Malone, principal at the Vertical Systems Group consultancy in Dedham, Mass.

"StrataCom has passed the hurdle," he said. "If you started out with an IPX and then found when you migrated up that their BPX doesn't have as much fan-out as needed, then this [Axis] is the best solution you could ask for."

©StrataCom: (408) 294-7600.

An ANTswer for switch management

1. AgentANT mirrors an SNMP-managed object table in a relational database so management can be extended beyond the limits of SNMP.



2. AgentANT's "Z-Dimension" represents the port connections and defines LANs by type, allowing disparate LANs to be represented within the same management structure.

3. Agent functions include port probing, examining statistical counters, checking for error conditions, creation of secure physical and virtual LANs, and user-defined filtering.

GRAPHIC BY TERRI MITCHELL

CrossComm

Continued from page 17

intervention.

ANT refers to its management capability as Rules-Based Auto Management.

"It's really going beyond what users think of as traditional network management," said Abbot Gilman, vice president of marketing and sales for ANT. "We've defined a set of conditions whereby the network is basically managed 100% of the time."

The key to ANT's management technique is AgentANT, silicon embedded in the ANTSwitch Ethernet switch that incorporates SNMP Management Information Base (MIB) structures for Ethernet switching, bridging and RMON capabilities, and an IP protocol stack.

AgentANT has three architectural elements that are essential to providing the ANTSwitch's Rules-Based Auto Management: a relational database of managed objects; a managed object table of switched port types; and algorithms that tie silicon-based functions to SNMP processing methods.

The relational database mirrors an SNMP-managed object table, also supported in AgentANT. This database can be accessed and manipulated by any TCP/IP-based management application via SNMP GET and SET commands. The benefit of using the relational database instead of the SNMP table is that switch diagnosis and configuration computations would be too intensive for standard SNMP processing, ANT officials said.

Also, historical traffic patterns can be generated and network domains created based on this data. With the exception of RMON, historical data is not maintained within SNMP.

And by adding information about the type of LAN supported by each port to the AgentANT MIB, the switch can provide more accurate tabulation of configuration, performance and diagnostic data.

"You have to view the switch in two ways," said William Regan, ANT vice president of software engineering. "As 16 or 64 separate and distinct LANs, and also as a whole."

The third element of AgentANT is its ability to distribute and collect from each port packet probe and error condition data, counter statistics, and filtering and firewall information. AgentANT's algorithms enable read/write access to each of these control bit definitions, which lets net managers establish rules for LAN configuration and diagnosis for each port.

©ANT: (508) 392-0690.

WE'RE NOT SAYING OUR DATA LINK SWITCHING IS THE BEST. DATA COMMUNICATIONS IS. WHO ARE WE TO ARGUE?

Data Comm MAGAZINE Hot Products

Data Communications called it "one giant step toward integrated networks," and "the best DLSw implementation now available." Good enough, we add, that both IBM and DEC have licensed it from us.

Reduce costs by 50%

And what it means, basically, is that you no longer need separate backbones for LANs and SNA networks. Because with Proteon's OpenRoute™ internetworking software, SNA traffic can now be carried across TCP/IP backbones at rates approaching wire speed. Which could reduce your data communication costs by as much as half.

A better way to run SNA

But DLSw is only part of the OpenRoute story. OpenRoute encompasses a variety of advanced technologies to provide you with the best solution for running your SNA traffic on a multiprotocol backbone.

OpenRoute is found in all Proteon routers, including the CNX™ (Corporate Network eXchange), DNX™ (Departmental), and the new RBX 200™ (Remote Branch), the most affordable, best performing remote branch solution available.

So give us a call today about our Open Routing solutions. We're working to make networking easier and more affordable for you. And who could argue with that?

proteon

Call now for your free reprint of the Data Communications article on DLSw.

OpenRoute, CNX, DNX, RBX 200 and the Proteon logo are trademarks of Proteon. All other trademarks belong to their respective owners.

800 - 545 - 7464

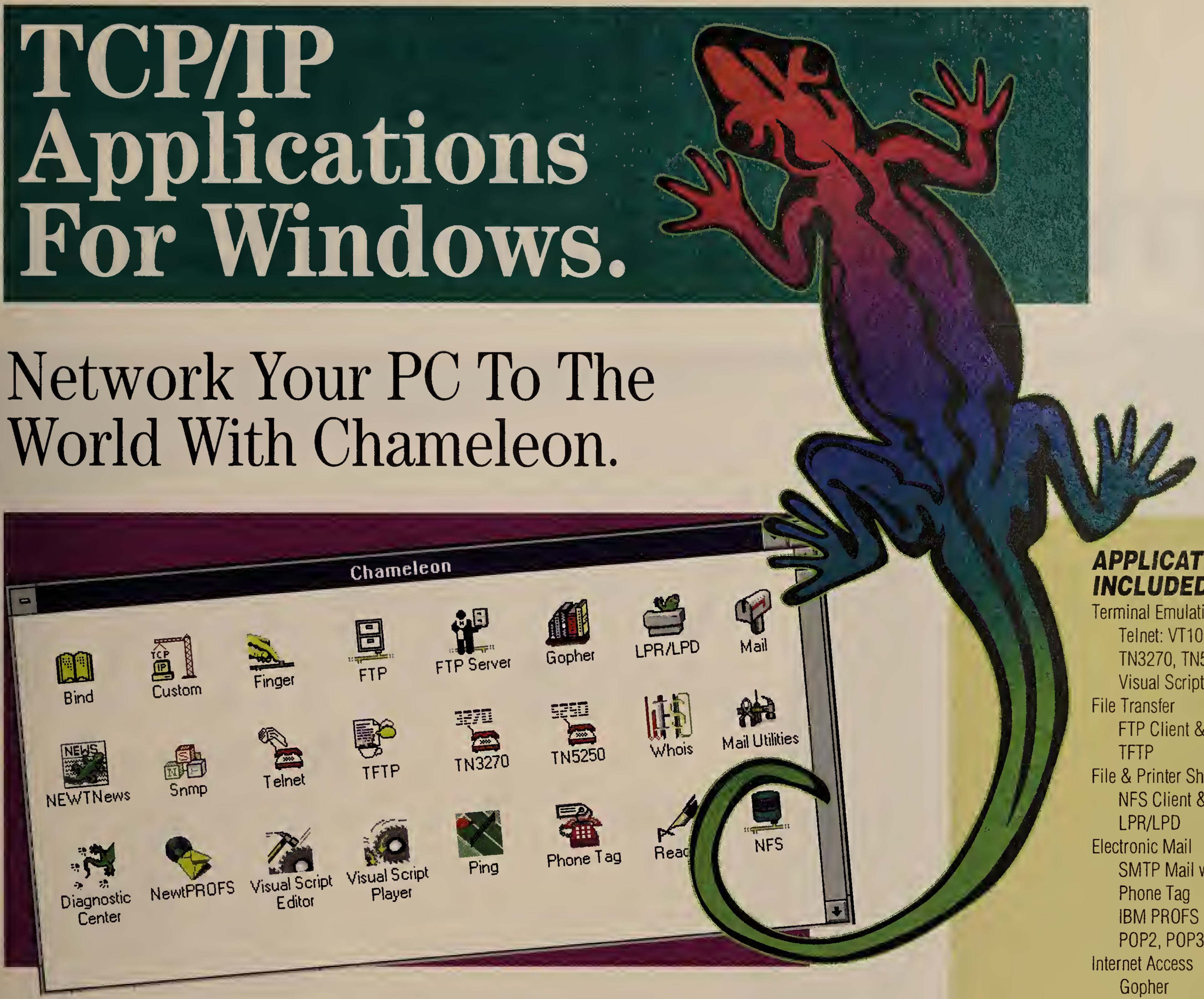
Circle Reader Service #35

TCP/IP Applications For Windows.

MICROSOFT® WINDOWS™ COMPATIBLE

yes NetWare Tested and Approved

Network Your PC To The World With Chameleon.



BEST VALUE.

Chameleon is a TCP/IP Windows software suite that offers more applications than any other product. It provides you with a comprehensive Windows solution for TCP/IP networking.

SEVEN INTEGRATED SOLUTION SUITES.

Chameleon includes seven integrated solution suites: terminal emulation, e-mail, file and printer sharing, remote access, network utilities, administration tools, and an easy point-and-click interface into the Internet.

SEAMLESS ACCESS TO OTHER HOST SYSTEMS.

Chameleon includes more applications that allow you to access information on Unix, mainframes, minicomputers, PC-based LANs and WANs, and the Internet.

OFFICE, HOME, AND REMOTE NETWORK ACCESS.

Connect to your network and the Internet via LAN or dialup access with one easy-to-use software package. Send and retrieve email, download files, print documents, login to remote hosts, and run client/server applications. Connect your PC to the world with Chameleon.

NetManage Chameleon includes WinSock TCP/IP and is 100% DLL. Chameleon requires only 6KB memory and installs in just 5 minutes.

Sept. 1994 Sept. 1994 Sept. 1994

APPLICATIONS INCLUDED:

- Terminal Emulation
  - Telnet: VT100, VT200, TVI, TN3270, TN5250
  - Visual Script Editor & Player
- File Transfer
  - FTP Client & Server
  - TFTP
- File & Printer Sharing
  - NFS Client & Server
  - LPR/LPD
- Electronic Mail
  - SMTP Mail with MIME
  - Phone Tag
  - IBM PROFS
  - POP2, POP3, SMTP
- Internet Access
  - Gopher
  - Newsreader
  - WhoIs
- Network Utilities
  - Ping
  - Finger
  - Diagnostic Center/Trace Agent
  - DNS Client & Server
- WinSock TCP/IP
  - 100% DLL TCP/IP Stack
  - Windows install and setup
  - LAN: Ethernet, Token Ring
  - Dialup: SLIP, CSLIP, PPP & ISDN

SPECIAL OFFER **Buy CHAMELEON and get ECCO Simplicity for only $30!**

PERSONAL AND GROUP INFORMATION MANAGER

Shared Calendars, Phone Books, and Projects

One copy of ECCO Simplicity with each version of Chameleon purchased. Special offer good thru January 31, 1995.

NETMANAGE™

(408) 973-7171
e-mail: sales@netmanage.com
World Wide Web: www.netmanage.com

© 1994 NetManage Inc., 10725 North De Anza Boulevard, Cupertino, California 95014, U.S.A. Fax (408) 257-6405. Specifications are subject to change without notice. All trademarks are property of their respective companies.

Circle Reader Service #41

Introducing five
Smart-UPS® increase

Choose our new Slimline Rack-mount design to protect servers, hubs, PBX and other rack-mount applications. Smart-UPS can be managed from any popular SNMP-based NMS.

yes
NetWare
Tested and
Approved

HP OpenView
Premier
Partner

SCO OK

Ready!™
for OS/2

Microsoft.
Windows NT.
Compatible

Lotus Notes server shutdown is included with PowerChute *plus* for each platform Lotus Notes supports.

Runs With
Lotus
Notes

Ask about
our Trade-UPS™
program.
Trade-in
An old unit, even a competitor's unit, for discounts
Toward a New APC Smart-UPS

FREE Power Protection Handbook or Power Management Software Demo Disk

What are the myths and musts of PC protection? What are the 10 most common power protection mistakes? Want tips for adding reliability to your LAN? Get your FREE handbook and find out!

☐ **YES!** I'm interested in trading up a competitive or older UPS to a Smart-UPS. Please send Trade-UPS info.

☐ **No!** But I would like a FREE : ☐ Handbook
☐ Demo Disk

Name: ______________________ Title: ______________

Company: ____

Address: ____

City/State/Zip: __________________________________

Phone/fax: ______________________________________

Brands of UPS used? ______________________________

☐ Reseller - # of servers sold per month? __________

☐ End User - # of servers on site? __________

E2

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 36 WEST KINGSTON, RI

POSTAGE WILL BE PAID BY ADDRESSEE

APC™
AMERICAN POWER CONVERSION
132 Fairgrounds Road
P.O. Box 278
West Kingston, RI 02892-9920

NEW ways APC network reliability

APC Smart-UPS®, the world's most preferred UPS, now enhanced with the perfect features for advanced business network protection

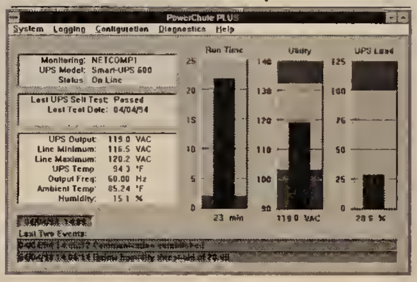
Power problems account for as much data loss and downtime as all other causes combined. And the bigger the network, the greater the risk. But not just any UPS will do. With your reputation on the line, you need proven reliability and performance power management (the total solution), and you get it all with APC's new Smart-UPS. Call today for info on our Trade-UPS® program or to receive more information on NEW APC Smart-UPS.

1 Want SNMP management, control via modem, or multi-OS support? New SmartSlot™ built-in accessory slot lets you customize the unit to suit your changing needs.

Ever want a new feature the unit you just bought doesn't have? APC's new Smart-UPS are equipped with an internal accessory slot which allows you to install an optional SmartSlot Accessory board. You can add capabilities as your network grows. SmartSlot accessories plug directly into your Smart-UPS. Currently you can choose from a Remote UPS management Device (for management via modem), UPS Interface Expander (to communicate with multiple servers from one UPS) and PowerNet SNMP Adapter (for wide-area management).

2 Paging or E-Mail on power failure? FlexEvents™ delivers custom notifications.

With optional PowerChute™ *plus* software you can configure the UPS' reaction to power problems, allowing you to plan for and control crisis situations before they impact uptime or threaten your data. For each possible power event users can choose one or more of the following UPS actions: Log Event, Notify Administrator, Notify Users, Shutdown Server, Run Command File, Page and Send E-Mail.



Monitoring: NETCOMP1
UPS Model: Smart-UPS 600
Status: On Line

Last UPS Self Test: Passed
Last Test Date: 04/04/94

UPS Output: 119.0 VAC
Line Minimum: 116.5 VAC
Line Maximum: 120.2 VAC
UPS Temp: 94.3 °F
Output Freq: 60.00 Hz
Ambient Temp: 85.24 °F
Humidity: 15.1 %

Optional PowerChute plus UPS management and diagnostic software provides unattended system shutdown, UPS testing/status, remote UPS management and environmental power monitoring.

3 Intelligent Battery Management™ system extends battery life

Improved reliability results from a high precision FastCharge™ battery charge system, with automatic true-load battery tests. Your Smart-UPS recharges 75% faster than competitive units, so you're prepared for multiple hits. Overcharge protection and continuous charging round out the Smart-UPS Intelligent Battery Management system.

4 SmartBoost/SmartTrim™ correct brownout and overvoltage conditions

For maximum reliability, a UPS should use its battery as infrequently as possible. SmartBoost and SmartTrim automatically step up low voltage and step down overvoltages to output that is safe for your system without using the unit's battery, allowing you to work through brownouts and overvoltages which shut other UPS systems down.

5 QuickSwap™ the 60 second, hot swappable battery replacement system

QuickSwap system saves the time and expense of returning the UPS to the factory for battery service. Allows safe and easy replacement of batteries while the system stays up and running. Replacement battery kits ship in a reusable box for hassle-free return of exhausted batteries. Call for more information.

Ask about our Rack-mount, Extended run, and v/s (value server) models!

Smart-UPS	Application	Sugg. List
SU450	*for servers and engineering workstations*	*$439*
SU700	*for servers and UNIX systems*	*$549*
SU1000	*for tower-type servers and UNIX systems*	*$769*
SU1400	*for multiple servers, telecom equipment and UNIX systems*	*$969*
SU3000	*for minicomputers, multiple serves and telecom equipment*	*$2599*

Computer ResellerNews Editors' Choice

Best Buy

LAN TIMES READERS CHOICE 1994
1990, 1991, 1992, 1993

UPS COMPUTERWORLD PLAY TO BUY

APC has won more awards for performance and reliability than all other UPS vendors combined... including five consecutive LAN TIMES Readers Choice awards...

APC™

AMERICAN POWER CONVERSION

800-800-4APC

APC EUROPE(+33)64625900 / ASIA/PACIFIC FAX: 401-789-1631
L. AMERICA FAX: 401-788-2716 / Compuserve: GO APCSUPPORT
Internet: aptech@apcc.com

Get Thunderstruck at Booth 2524

Circle Reader Service #26

© 1994, APC, Smart-UPS, PowerChute, SmartTrim, SmartBoost, QuickSwap, FastCharge, PowerNet, PowerNet SNMP Adapter and SmartSlot are trademarks of APC. Other trademarks are the property of their owners. Specifications subject to change.

INTERNETWORKING MONITOR

by Dan Minoli

A call for term limits in standards development

Are standards becoming irrelevant? Given how long they often take to develop, the answer is quite possibly yes.

In spite of implications to the contrary, it still takes about five to 10 years to finalize major enterprise standards. Some recent examples include ATM, FDDI, the Fibre Channel Standard and X.400.

Unless the standards process is streamlined and professionalized, the vendor and user community may simply turn their backs to the promised, but slow-in-coming, advantages of standards.

Technology is currently progressing at a bewildering pace, with new generations of products entering the fray every 18 to 24 months.

Consider the premises networking area. The past five years have seen the introduction of switched Ethernet, two versions of 100M bit/sec Ethernet, switched 100M bit/sec Ethernet, FDDI, FDDI II, switched FDDI, two versions of integrated multimedia LANs (802.9 and 802.9a), full-duplex LANs at 10M and 100M bit/sec, as well as several versions of ATM.

This means a standard that was 10 years in the making is out-of-date by five generations of technology when it is finally complete.

The problem is that standards are developed mostly in an ad hoc way, not a professionalized manner.

Here's a typical scenario: A certain group of people with some interest in an area, and a burning desire to travel, bands together and starts meeting six, eight, 12 or more times a year. More often than not, there are no preestablished or abiding target dates for when the work should be definitively completed.

In fact, for some individuals, there are strong disincentives to completion and disbanding; they will lose the chance to travel all over the country or the world.

Awhile back, a colleague of mine was proud about the 450,000 bonus miles accumulated in a couple of years of standards work (I think that's the equivalent of 22 free tickets). Another colleague helpfully indicated that she knows Geneva better than her own small hometown in the U.S.

In addition, these standards-making individuals typically attend meetings under the auspices of two or three different bodies — for example, the ITU-T, T1S1 and ATM Forum. They tend to develop different versions of the same standards for reasons that are not always entirely clear.

Then, after these variants are published, they offer to attend many more meetings in order to achieve harmonization between the standards.

Moreover, there is a lot of ego involved, so standards tend to incorporate redundant functions and obscure capabilities offered by distinct individuals (annexes often serve exactly such porcine purposes).

The sad fact is that the user community must pay for this slow, unprofessionalized approach to standards development since vendors must load the cost of all the people-power and travel involved into the products they eventually sell.

It doesn't have to be that way.

The standards process should mimic normal business practice, complete with production cycles and strict deadlines.

Accreditation of both the standards organization and the individuals involved in it should be based on their ability to meet these deadlines.

In that scenario, we could put term limits on a given standards group, ensuring that it disbands once its work is done. That would eliminate self-perpetuating groups that serve questionable purposes and foster a more streamlined standards process that could keep up with the pace of technology.

➾ Minoli is a principal consultant at DVI Communications, a full-service consultancy in data, voice and video based in New York. He can be reached at minoli@pipeline.com. Minoli shares this space with Scott Bradner, whose column will appear next week.

THIS COULD BE THE SINGLE MOST IMPORTANT BENEFIT OF OUR DIGITAL TRANSMISSION PRODUCTS.

EVEN IF YOU'RE NOT THE TYPE TO LOSE SLEEP OVER PROBLEMS AT WORK, YOU CERTAINLY DON'T NEED ANYTHING THAT MAKES YOUR JOB HARDER. LEAST OF ALL, YOUR NETWORK'S CONNECTION TO THE OUTSIDE WORLD. OUR CSU/DSUS, TERMINAL ADAPTERS AND MULTIPLEXERS ARE DESIGNED TO INDUSTRY STANDARDS, BUILT FOR UNMATCHED RELIABILITY AND ENHANCED WITH OUR OWN PATENTED TECHNOLOGY. THE RESULT IS SIMPLE: YOU CAN'T BUY A BETTER PRODUCT FOR YOUR DDS, T-1, ISDN OR SWITCHED 56 NETWORK. THAT'S WHY EVERY MAJOR U.S. TELEPHONE COMPANY USES OUR DIGITAL TRANSMISSION EQUIPMENT. CALL FOR MORE INFORMATION TODAY, AND PUT A FEW MORE PROBLEMS TO BED. 1-800-326-3700, EXT. 126.

ADTRAN

ONE LESS THING TO WORRY ABOUT.

©1995 ADTRAN, INC 901 EXPLORER BOULEVARD, HUNTSVILLE, ALABAMA 35806-2807

Circle Reader Service #27

FDDI ADAPTERS REMOTE OFFICE SOLUTIONS STACKABLE HUBS TOKEN RING ADAPTERS

WORKGROUP SOLUTIONS ETHERNET ADAPTERS CHASSIS HUBS BUILDING/CAMPUS SOLUTIONS FDDI ADAPTERS

WAN BACKBONE SOLUTIONS SWITCHING HUBS REMOTE OFFICE BRIDGES & ROUTERS PERSONAL OFFICE SOLUTIONS

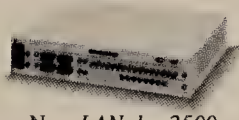
Why to switch.

Switching is the most cost-effective way to add bandwidth to your network.

LinkSwitch 1200

How to switch.

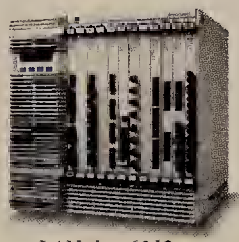
It's easy, just add a switching hub to your existing network.



New *LANplex 2500*

When to switch.

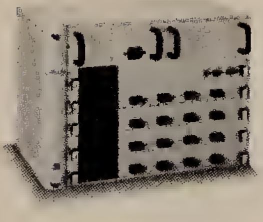
Now. Because you can immediately make better use of your network.



LANplex 6012

Where to switch.

Many times it's where you're currently routing. You may need both.



New *CELLplex 7000*

Who to switch with.

3Com®—the switching market leader.

No ad could possibly answer all your switching questions. But because we pioneered high-speed switching technology, no other company can answer them like 3Com.

What's more, only we can meet all your network switching needs with our award-winning products.

It starts with our robust LANplex® 6000 switching hub that can anchor the networking resources of your campus backbone. Or, if your needs are on a departmental level, the new LANplex 2500 is a perfect performance booster. And if you need more bandwidth for your workgroups, we have the LinkSwitch™ family, which we offer as an integral part of our SuperStack™ system or as a module in the LinkBuilder® MSH™ multi service hub.

Plus, our CELLplex™ family of high performance ATM switches provides powerful ATM backbone performance and seamless Ethernet/ATM integration. As a matter of fact, our ATM switching hubs perform so well, they were recently awarded *Data Communications'* "Hot Products" award.

To find out more about the why, how, when, where and who of switching, call **1-800 NET-3Com** for our *Making Sense of Switching* kit.

3Com®

PCMCIA ADAPTERS CENTRAL SITE ROUTERS NETWORKS THAT GO THE DISTANCE

Leadership based on the 1994 Dataquest LAN Switching market report. Switching is just one part of 3Com's High Performance Scalable Networking strategy, and tying it all together is Transcend™ Network Management.
©1995 3Com Corp. (408) 764-5000. 3Com, LANplex, LinkBuilder, SuperStack, LinkSwitch, MSH CELLplex and Networks That Go the Distance are trademarks of 3Com Corp.

Circle Reader Service #38

THE

PERFORMANCE

OF RISC AND

WINDOWS NT.

WITHOUT

THE RISK.

The NEC Express RISCserver™ was designed expressly to protect your data in business-critical applications. We gave it internal RAID, UPS, an integrated service modem, and ECC memory—all of which ensure superior dependability. But equally as important is the MIPS RISC architecture itself—the same platform Microsoft used to design Windows NT.™ Add to that the scalability of NEC's MultiRISC™ architecture and NEC's three-year limited on-site warranty, and you have some powerful reasons to consider the Express RISCserver. For more information, call 1-800-709-3434. After all, why risk your valuable information with anything less?

Express RISCserver, MultiRISC and See, Hear and Feel the Difference are trademarks of NEC Technologies, Inc. All other trademarks and registered trademarks are the property of their respective owners. For information via FastFacts™ call 1-800-366-0476 and request doc. # 97774721. © 1995 NEC Technologies, Inc. NEC GSA#GSOOK94AGS5241

SEE, HEAR AND FEEL THE DIFFERENCE.™

NEC

Circle Reader Service #32

Vendors look at policy-based mgmt. for switched internets

BY JIM DUFFY

Washington, D.C.

Switching vendors are mulling over policy-based management as a way to help their customers migrate from shared-media LAN internetworks to high-speed switched internets.

At a recent roundtable discussion sponsored by McConnell Consulting, Inc. and *Network World,* vendors agreed that they must add more management intelligence to switches in order to take some of the burden off customers, which have a myriad of other issues to deal with in the transition to switched internetworking based on ATM technology.

"Network management is a key focus for us in terms of making it more available at the resource and simpler to use through policy management tools," said Bill Lozoff, director of corporate product marketing at UB Networks, Inc. "Getting the customer through that complex environment is part of the vendor's responsibility."

Other participants included Michael Harrison, director of advanced product engineering at Cabletron Systems, Inc.; Jim Kuenzel, switch development manager at Digital Equipment Corp.; Larry Lang, senior product-line manager at Cisco Systems, Inc.; Terry Robinson, senior product manager in the Enterprise Systems Group at Chipcom Corp.; and Rick Tinsley, director of product marketing for Newbridge Networks, Inc.

While users will make the transition to switching gradually, a recent study by McConnell Consulting shows that some are already relying on switches to supply 50% of their workgroup bandwidth. At the same time, the study states that customers want to protect their investments in shared-media infrastructures while migrating to switching, the result being hybrid environments of shared-media LANs, switched LANs and Asynchronous Transfer Mode.

The McConnell Consulting study also shows that users are more concerned with the manageability and cost of switch ownership than in raw performance.

JOHN McCONNELL

That's where policies can help. They enable net managers to establish guidelines for resolving addressing inconsistencies, performance bottlenecks and security administration issues that crop up in these hybrid environments. Switches outfitted with sufficient intelligence can then make their own management decisions based on these policies.

For instance, policy-based management could help handle the LAN Emulation activities in these hybrid environments, the vendors said.

LARRY LANG

LAN Emulation servers, which translate addresses of devices attached to shared-media LANs into the appropriate ATM circuit identifiers, work closely with the connection management system (CMS) component of route servers. The CMS assigns routes across an ATM backbone and sets access controls in frame switches. Routers interact with the CMS when LAN traffic flows across the ATM backbone.

Administrators could establish policies that define which shared-media addresses to allow onto the ATM backbone.

A policy "has to be able to inform edge switches and LAN switches of that capability," said Cisco's Lang. "As people use more connectivity out to the wide area, they need the equivalent of a lobby for your network where you let the general public in, check them out and make them sign in."

Policies could also be established for resolving duplicate Layer 3 IP addresses. If a network administrator mistakenly assigns the same IP address to different end stations, route servers in a switched environment can instantly identify the address. A policy would induce the route processor to generate a trouble ticket and deny access until the problem is resolved.

"That's a real-world example of how ATM-based management systems are going to provide a lot of value to network managers," said Newbridge's Tinsley.

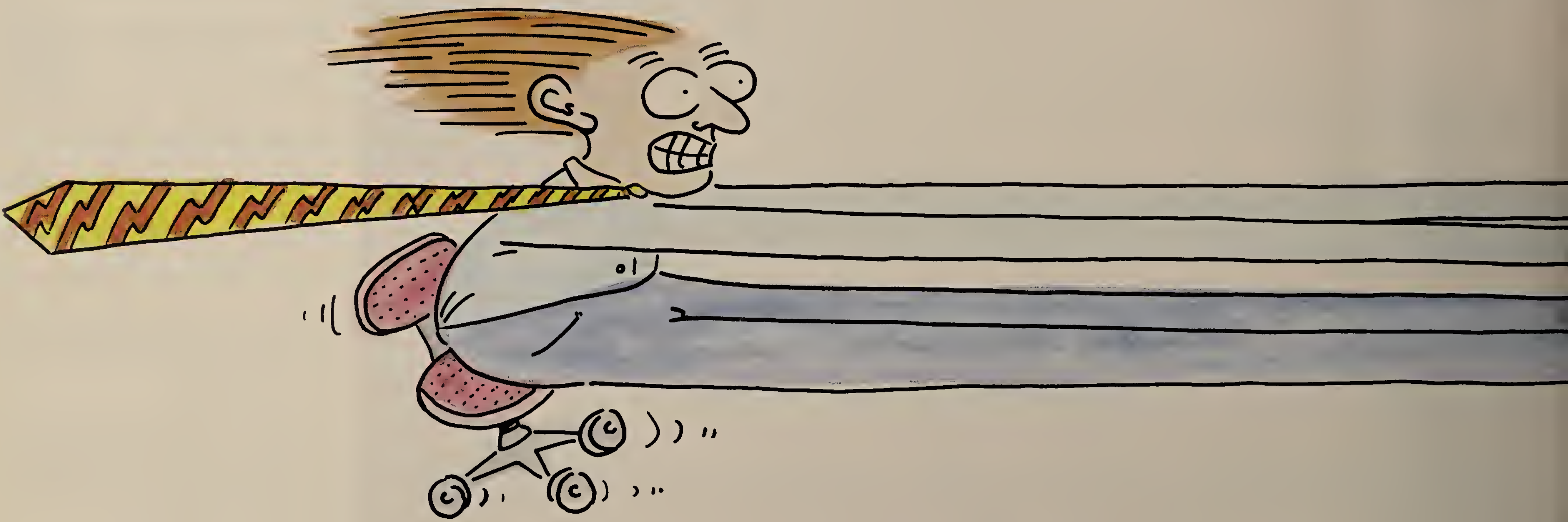
Policy-based management can also be used to alleviate performance bottlenecks or assign an optimal amount of bandwidth for net applications, the vendors said. The CMS can use policies to assign bandwidth by application requirements, user group, time of day, total bandwidth per user and other parameters.

"You need the sort of tools where you put in historical data and engineer [it so] you don't get busy signals," Lang said.

RICK TINSLEY

Policies can also simplify physical moves — a burdensome task in today's routed networks. The CMS recognizes a new station attached to any switch port and interrogates it. If the system is registered, all privileges are moved to the new station automatically. If, however, the system is unknown, the switch port is disabled and an alarm is generated.

Present-day LAN probes and autodiscovery capabilities could play a role in policy-based management of switched internets, the vendors said.



UNAWARE OF ITS SPEED, FRANK TRIES OUR NE

Like a lot of other Microsoft® Windows users on TCP/IP networks, Frank used to spend a lot of time waiting for corporate data to trickle down to his PC. But no more. Now Frank has PC-NFSpro,™ SunSoft's™ new high performance TCP/IP networking software. So he can fly around his organization or even the Internet, accessing applications, and sharing information, with more speed and functionality than ever. The reason is, PC-NFSpro is built on a 32-bit VxD architecture, and optimized for Windows. Giving Frank access to hundreds of Windows applications, plus built in e-mail, and remote services, all operating at peak performance. It installs fast, too. In fact, it automatically connected Frank to his

© 1994 Sun Microsystems, Inc. Sun, Sun Microsystems, SunSoft, NFS, PC-NFS, PC-NFSpro and the SunSoft logo are trademarks or

NASA launches Internet EDI purchasing program

BY ELLEN MESSMER

Greenbelt, Md.

The National Aeronautics and Space Administration this month began using Electronic Data Interchange over the Internet for buying large volumes of workstations from its established contract suppliers.

The EDI initiative, launched at NASA's Goddard Space Flight Center here, sprang from the agency's need to meet the electronic commerce goals set for government last year by President Clinton.

As its first step, NASA is sending purchase orders in ANSI X12 standard format over the Internet to workstation supplier IBM.

"The president last year mandated EDI, and that turned up the heat for us," acknowledged Doug Hanson, NASA's manager for the Scientific and Engineering Workstation Procurement Program, which buys about $50 million worth of computers each year. "We're getting EDI up and running with eight vendors so we can order from them electronically."

NASA is using Premenos Corp.'s Unix-based EDI/E software to convert electronic purchase orders generated by Goddard's accounting system into standard X12 850 format.

"This output arrives in a flat file from the mainframe over the network," Hanson said. "In the past, we would have simply printed it out and mailed it, but now it becomes an EDI file."

ENCRYPTION

Before sending them to IBM over the Internet, each EDI purchase order is encrypted using Templar, an EDI encryption and authentication application from Premenos based on RSA Data Security, Inc. public security technology. Templar, now in beta test, will ship this spring, according to Daniel Federman, president and chief executive officer of Premenos.

The Internet holds some advantages over traditional value-added networks for electronic commerce, Federman said. When you send EDI messages over the existing private networks, you pay by the drink for each message, he said.

The Internet is based on bandwidth pricing, so you can afford to send things much faster. ◘

Escrow key unlocks data in emergency

BY ELLEN MESSMER

Redwood City, Calif.

An encryption product that gives an organization's management the master key for unscrambling any employee's files is winning plaudits from beta users for its ease of use.

RSA Data Security, Inc.'s RSA Secure is aimed at protecting data stored on laptops and transmitted from the field, such as sensitive sales information.

At both the Social Security Administration (SSA) and automotive manufacturer Solectria Corp., where the Windows-based RSA Secure software is getting a test-drive, the product is providing quick and transparent file encryption for end users.

With RSA Secure's master key function, called Emergency Access, management can unscramble an employee's encrypted file when the person is absent.

The company can do this by using an escrow key that is split up and held among as many as eight encryption key "trustees." Combining the split key segments produces the master key that unlocks each encrypted file.

The concept of key escrow encryption has been hotly debated for more than a year since the Clinton administration backed the so-called Clipper Chip as a government standard. Clipper Chip gives federal authorities a master key for unscrambling information encrypted with it, a power decried by civil liberties groups as a threat to privacy.

While RSA Secure is a key-escrow system, too, an organization's management, not the government, holds the Emergency Access master key. And unlike Clipper Chip, an employee using RSA Secure can always override the escrow-key function to keep personal files private.

"With RSA Secure, the corporation has access to this on an emergency basis. People just don't want the government controlling it," said Jim Bidzos, president of RSA.

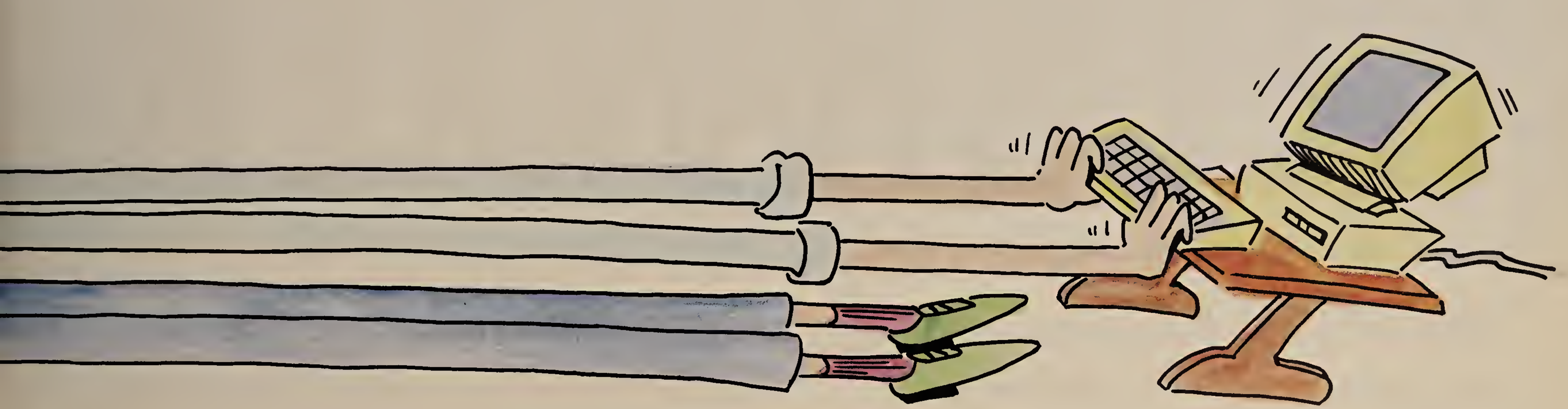
According to Jeff Thompson, director of electronics development at Wilmington, Mass.-based auto designer Solectria, RSA Secure software easily installs to become another option in Windows File Manager, automatically encrypting files at the moment when the user exits the session.

"If the individual is not available to decrypt a file, RSA Secure is there, so the company itself doesn't feel helpless," Thompson said. "The idea is that the file is company property."

John Sabo, officer for policy and external affairs at the SSA, said RSA Secure is proving simple to administer from both the end-user and network manager viewpoint since the encryption functions are initiated via passwords.

Sabo recently reviewed federal guidelines about privacy to determine what limits management may face if the SSA uses this or similar products in the future.

"There is an authority to open the desk of an employee without his permission, but it's a very high authority not passed down to the supervisor," he said. "There's certainly an analogy to the computer here, and it makes sense to access a computer when a person is unavailable." ◘



TCP/IP WINDOWS SOFTWARE FOR THE FIRST TIME.

local network in less than two minutes. **P**C-NFS*pro* also can connect a few or a few thousand users, in LANs or WANs. And thanks to new Windows tools and advanced network technology—like DHCP, PPP, and NFS—everyone can have easy configuration, remote access, and transparent file sharing. **A**nd right now, you can have PC-NFS*pro* at very attractive prices. Like $50 for an evaluation package, and upgrades of anyone else's networking software starting at just $115. Call us at 1-800-SUN-SOFT for more details. **B**ut beware: PC-NFS*pro* is a lot faster than what you're used to. Right, Frank?

SunSoft

registered trademarks of Sun Microsystems, Inc. All other products or services mentioned herein are trademarks of their respective owners.

APRO

N.E.T. can HANDLE it.

Get the multiservice backbone that runs the world's most demanding networks.

What have you got on your network? And what does the future hold? Voice, video and data? More users? More applications? More equipment? No problem. There's not much an N.E.T. network can't handle. ◆ *We have built many of the world's largest backbone networks. Networks that can expand across continents or oceans and allow you to integrate all types of equipment and applications on the same platform.* ◆ *Why go with a backbone network? To be in complete control. To easily add new applications and technologies. And to lower costs.* ◆ *Go with an N.E.T. backbone and your network will also be fail safe. Why? Because all nodes are intelligent and operate independently. Your network is up and running — even if a disaster strikes.* ◆ *The proof? The world's most information-intensive companies use N.E.T., including three of the top four global airline reservation systems, all major U.S. automakers, eight of the top ten banks, and three of the top six world stock exchanges. And we can handle you.*

NETWORK EQUIPMENT
TECHNOLOGIES

A complimentary white paper by Robbie Forkish, one of the industry's foremost networking authorities.

To receive a copy of "Multiservice Backbone Networks," call 1-800-388-4638, dept. N31 or access the white paper at the following Worldwide Web address: http://www.net.com

N.E.T., 800 Saginaw Drive, Redwood City, CA 94063-4740, U.S.A. Phone: 1-800-388-4638 Fax: 1-510-713-0172 Internet address: http://www.net.com

Copyright © 1994 Network Equipment Technologies, Inc. All rights reserved. Network Equipment Technologies, N.E.T. and the N.E.T. logo are trademarks of Network Equipment Technologies, Inc.

LAN WORLD

A Special Monthly Section for LAN Decision Makers

INSIDE

LAN managers struggle to discover more entry points into the Internet. **Page L2.**

WUGNET: Collaborating in real time over TCP/IP. **Page L2.**

Interphase's low-cost ATM cards may pressure others to follow suit. **Page L4.**

Vendor says ATM25 should be the technology of choice for desktop links. **Page L8.**

Saber follows bundling trend and creates a LAN management system for NetWare. **Page L10.**

Micro Focus unveils products for migrating COBOL apps to client/server environments. **Page L12.**

Cubix introduces management software for its servers. **Page L12.**

Mark Gibbs foresees networking in the year 2000. **Page L18.**

BRIEFS

Novell, Inc. announced last week that it has agreed to license the Netscape Navigator **World-Wide Web browser** from Netscape Communications Corp.

Novell will bundle the browser in products such as WordPerfect Internet Publisher Pro for Windows, an add-on module for WordPerfect that includes Web publishing tools. Netscape also will be included in the package of Web browsing technology, code-named Corsair and Ferret.

Novell: (800) 638-9273.

The Santa Cruz Operation, Inc. and **Unisys Corp.** today will announce a strategic marketing alliance under which Unisys will resell SCO Open Server software products with Unisys PW2 Advantage Series server and client hardware.

The alliance will target Unisys retail, financial and government markets, and will allow the companies to provide customers with joint sales, marketing, service and support personnel.

As an initial step, the companies will preinstall Lotus Development Corp.'s Lotus Notes and the SCO Open Server Enterprise Unix operating system on Unisys' Intel Corp. processor-based servers.

SCO: (800) 726-8649; Unisys: (800) 448-1424, Ext. 4.

Ancor Communications, Inc. last week introduced the FCS 250 VME/64 Fibre Channel network adapter.

The adapter allows workstations and servers using a 64-bit VMEbus to connect to ANSI-standard **Fibre Channel** networks at up to 266M bit/sec.

The adapters, which can be used in either point-to-point or switched configurations, are available starting at $4,995.

Ancor: (612) 932-4000.

Hot LAN tools relieving net management burden

In this quarter's review of innovative LAN products, we present two software tools and a must-read book for those concerned about on-line privacy. The first utility is designed to help users deal with NetWare file server outages and the second to help ease the burden of translating data from one file format to another.

BY MARK GIBBS

Network managers usually have a heap of responsibilities, so anything that simplifies their work isn't just useful, it usually makes the difference between them being effective and the human equivalent of a headless chicken.

Tools that can help network managers cope with network file server crashes and file management definitely rank highest among those that reduce stress levels.

Operational management for network servers encompasses not only the processes of tuning, maintaining and upgrading, but also ensuring that the wretched things keep running. This latter issue, server availability, is usually the hardest to deal with if you should hit a run of server crashes.

One of the hardest network operating systems to manage in this respect is Novell, Inc.'s NetWare. When NetWare crashes, it usually does so with finality — it simply stops.

Circuit Masters Software, Inc. of Sugarland, Texas, offers the Server Sentry utility, which not only restarts the system, but also reports on the error condition and analyzes the financial consequences of the outage.

IS MISBEHAVIN'

When NetWare decides to misbehave seriously, for whatever reason, it does what Novell calls abnormal ends, or "abends." This means the net operating system enters into such a severe error condition that it can no longer function.

When NetWare abends, it prints the contents of the processor registers and offers the option of dumping a memory image to the DOS partition on the server's hard disk. Novell's technical support staff or a third-party NetWare Loadable Module (NLM) developer is able to, in theory, use the server memory dump for subsequent analysis.

But, in reality, NetWare's handling of abends is oddly unsophisticated.

When such a condition occurs, network managers are offered the choice of hitting the Y key to dump and the X key to exit to DOS. They do not get a chance to wait and then automatically dump or exit back to DOS. And if network managers are not there when the system abends, the server will just sit and twiddle its virtual thumbs

See LAN tools, *page L15*

Hot tickets

	Circuit Masters	Keyword Office Technologies
Product	Server Sentry	KeyView 4.1
Function	A tool for handling and reporting on NetWare file server "abends"	A comprehensive and well-organized file viewer and format translator
Platform	NetWare 3.X and 4.X	Windows 3.1
Pricing	$379 per server; site licenses also available	$89 per user; site licenses also available
Address	10014 Kent Town Sugarland, Texas 77478	2816 11th Street N.E. Calgary, Alberta T2E 7S7
Telephone	(713) 242-9353	(800) 866-6539
Fax	(713) 242-4632	(403) 250-1964
Book	***PGP: Pretty Good Privacy***	
Author	Simson Garfinkel	
Summary	A thorough guide to the PGP freeware program	
Pricing	$24.95	
Publisher	O'Reilly & Associates, 1995	
ISBN	1-56592-098-8	

Digital offers users broad remote LAN access choice

BY MICHAEL CSENGER

Maynard, Mass.

Digital Equipment Corp. last week entered the remote LAN access market with a line of access servers available as stand-alone units, wiring hub modules or server software upgrades.

The NetRider Remote Access System, which scales from eight to 32 ports, should appeal to Digital's installed base, which can add remote LAN access in eight-port increments to any DECserver network server or DEChub wiring hub.

NetRider enables remote workers and mobile staff to dial in to the corporate LAN over standard modem connections.

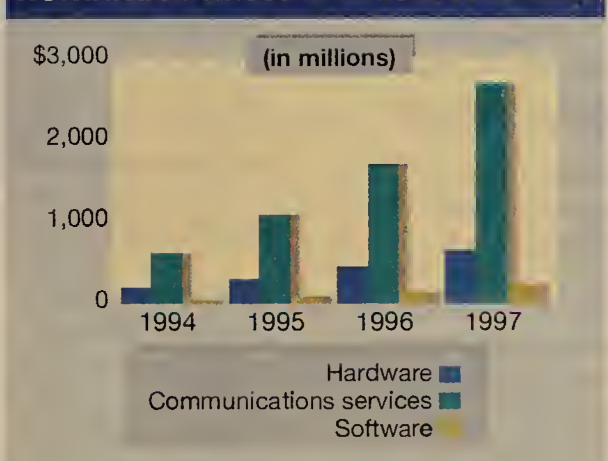
Digital also hopes to gain new customers by promising them a simple migration path to larger integrated platforms as their server demands grow.

The eight-port NetRider 90 and 32-port NetRider 900 can be stacked if necessary to achieve higher port counts.

Both servers support the new 28.8K

See Digital, *page L4*

Worldwide remote LAN access market



Communications services — from Internet access to value-added network offerings — account for the largest share of remote access costs.

GRAPHIC BY TERRI MITCHELL SOURCE: THE YANKEE GROUP, BOSTON

Novell perched to extend NetWare's reach with NEST

BY KEVIN FOGARTY

Provo, Utah

Novell, Inc. last week released a software developers' kit (SDK) it hopes will move NetWare beyond the file server and into set-top boxes, security systems, building controls, cellular phones and other devices.

The Novell Embedded Systems Technology (NEST) 1.0 SDK lets developers link a variety of intelligent devices to NetWare LANs and gives them full access to NetWare network services, such as file and print, Internet access, messaging, and security and authentication.

The technology is aimed primarily at commercial product developers, said Darl McBrode, vice president and general manager of Novell's Extended Networks division.

Third-party vendors agreed that NEST has promise, as 33 of them rallied around Novell by pledging to build NEST-enabled products. Developers will include Hewlett-Packard Co. and Xerox Corp., which will build NEST-enabled printers, and Motorola, Inc., which will embed NEST technology into its wireless communications gear.

Microsoft Corp. in 1993 released a product similar

See NEST, *page L3*

Windows Connectivity Forum

Collaborating in real time over TCP/IP

By Joel Diamond
Technical director

WUGNET
Windows User Group Network
76702.1023@CompuServe.com

A new class of Windows-based collaborative editing tools will allow you and others to jointly revise reports – including text, data and graphics – across a TCP/IP link and from within the native application of those objects being edited.

Moreover, those changes will be displayed in real time.

One such tool, Insitu, Inc.'s Insitu Conference, provides all of these capabilities, allowing you to better prepare for meetings and reduce the time taken to complete group projects.

The real power of this tool comes from its support for Microsoft Corp.'s OLE 2.0 technology for linking applications and the objects within them over network links.

Here's a typical way the software can be used:

You and two IS staff colleagues have been working on a report for your boss that consists of a spreadsheet and related text to convey your message. As you establish a network connection over TCP/IP with your colleagues, you insert an Excel spreadsheet object that all of you can see.

One colleague notices an error regarding the number of servers you anticipated needing next year and double clicks on the spreadsheet, activating it via OLE 2.0. That person changes the number and when he clicks outside the object to return to the conference frame, the rest of the conference participants see an update in their own windows.

You can repeat this procedure for a Word document object or any OLE 2.0-enabled application. For non-OLE applications, you can use a screen capture tool to place a bitmap on the screen for reviewing.

In most Windows 3.1 conferencing applications available today, such as Talkshow from FutureLabs, the user has to wait patiently (or impatiently) for data to arrive across the net. During this time, a dialog box or an hourglass may appear in your screen, essentially taking control of the system away from you.

Insitu has circumvented this problem by processing all data exchange in the background, allowing you to continue working in Conference or any other Windows application without interruption.

Insitu also addresses workgroup efficiency via a proprietary algorithm that transmits only changes to a document across the net, rather than sending an entire copy of an edited document.

Insitu also addresses the voice component of workgroup communications. As you may have seen in last week's column, the Telephony Application Program Interface (TAPI) may be a key technology for future telphony-aware applications, and Insitu Conference supports TAPI 1.0. This will allow you to automatically connect to a colleague's phone at the same time that you establish a computer conference link via WinSock.

Finally, I found the software easy to use, allowing me to prepare multiple frames in advance and then walk through them with colleagues. Just wait until this software is available on Windows 95.

You can download a 30-day evaluation copy of Insitu Conference from the WINCON Groupware/E-mail section or from Insitu's bulletin board at (617) 279-3118. Insitu can be reached by electronic mail at sales@insitu.com or by phone at (617) 720-0821.

CHECK OUT WINETA

I'd like to call your attention to a companion forum to WINCON, known as the Windows Networking Vendors A Forum (WINETA), that provides support to users of Windows connectivity products. Vendors providing support on WINETA include Beame & Whiteside Software, NetSoft and Optus.

New vendors include net management vendor HawkNet and groupware and conferencing vendor Trax Softworks, Inc.

An evaluation version of TeamTalk 1.1 from Trax is available in Library 7 in the TT11EV.ZIP file, while you can access HawkNet's NetTune PRO Full Function for a 30-day trial in Library 5 in the NT6000.ZIP file.

CompuServe®

To participate on the Windows Connectivity Forum, type **Go Wincon** at any ! prompt on CompuServe. For those of you who are not CompuServe subscribers, *Network World* and the Windows Users Group Network are offering a free membership sign-up by calling (800) 524-3388. Ask for Operator 426.

LAN users find they have limited 'Net access options

IS managers need to discover more entry points into the Internet.

BY JOANNE CUMMINGS

Despite all the hype surrounding the Internet as a business tool, LAN managers have few reasonable options for giving desktop users an entry point into this massive network of networks.

To tap into the Internet, each LAN client needs access to a TCP/IP stack and Internet-specific software, such as File Transfer Protocol (FTP), Gopher, Mail and telnet. But typical LANs, such as those running Novell, Inc.'s NetWare network operating system (NOS), seldom run TCP/IP as the primary protocol.

Network managers can remedy this in two ways. They either can install a dedicated Unix server configured with the requisite TCP/IP and Internet software, or they can outfit every client with software and a Serial Line Internet Protocol (SLIP) connection.

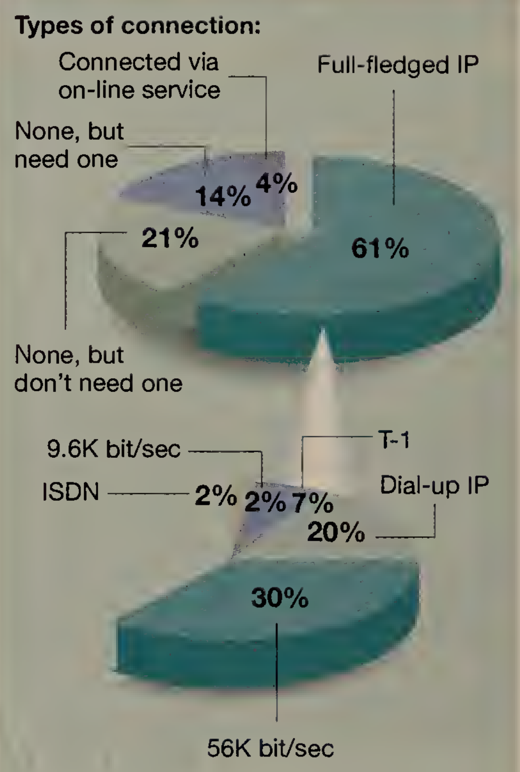
For non-Unix based LANs, both options leave something to be desired.

A Unix server provides a fairly robust Internet gateway but brings on additional complexities and costs to the network. While SLIP alleviates the hassles and costs associated with installing and managing a Unix server, it results in a myriad of phone lines since each client needs its own dial-up connection.

Network managers who can wait a year or so will find more options as a variety of vendors deliver on promises to offer Internet access products. IBM, for instance, plans to offer Internet access in its OS/2 Warp operating system, as does Microsoft Corp. in Windows 95.

And for the huge NetWare population, Novell promises a server-based solution that will provide TCP/IP access to Internet services, navigation tools such as newsreaders, and support for appropriate electronic mail protocols (*NW*, Nov. 28, 1994, page 1). Novell, based in Provo, Utah, declined to discuss details of the product, which it said is in the early planning stages.

Internet breakdown



Figures are based on 54 Fortune 1,000 firms. Two-thirds of the firms have an Internet link, more than half of which are less than 1 year old.

SOURCE: FORRESTER RESEARCH, CAMBRIDGE, MASS.
GRAPHIC BY TERRI MITCHELL

Analysts note that NOS-based Internet access would be a real breakthrough.

"People are looking for something that's a gateway and security block but is still inexpensive, easy to deal with, easy to buy, easy to install and easy to manage," said Norton Greenfeld, president of Implements, Inc., a Wayland, Mass.-based consultancy.

The Novell product, because it would be incorporated in the NOS, "has that feel," he added.

NLM FOR TODAY

NetWare managers with more pressing needs already have an alternative available. Firefox, Inc. of San Jose, Calif., released in December server-based NetWare Loadable Module software that it said has everything needed to cruise the Internet.

The software, called NovIx for Internet, has FTP, TCP/IP and telnet support, as well as access to generic Internet applications such as Enhanced NCSA Mosaic from Spyglass, Inc., Gopher, News Reader and Mail. It also includes a firewall capability that prevents unauthorized users from accessing either the NetWare services or the Internet.

NovIx costs $1,425 for a five-user license.

"It's good because it's server-based," said Cheryl Currid, president of Currid and Co., a Houston-based consultancy. "The other option is to run dual stacks on the client, both TCP/IP and IPX. But I really hate that configuration. I'm worried about the cleanliness of trying to do dual stacks on the client because you chew up so much of the client's lower RAM."

But with such software being only two months old, a Unix server provides the far more secure, stable route, according to users and analysts.

"If you really know what you're doing, you put a Unix box there, and it's on the 'Net as a host," Greenfeld said. "That works well and gets everybody onto the Internet."

UNIX OPTIONS

For Unix shops, this alternative is a no-brainer.

"Our LAN environment is Unix-based, so that makes connecting to the Internet significantly easier because most of the utilities used to communicate to the Internet are the same utilities that people use to communicate between their machines," said Bob Holzgraf, WAN manager at Mentor Graphics Corp., an engineering software firm in Wilsonville, Ore. "People are used to things like telnet and FTP."

Mentor uses the Internet to send E-mail, receive Associated Press news feeds and distribute software patches and pieces of code, Holzgraf said.

Heavy traffic mandates use of a dedicated 256K bit/sec link, which the company gets from Performance Systems International, Inc. (PSI), a commercial Internet service provider. A Cisco Systems, Inc. router provides a firewall.

"We bring in the Internet connection from PSI through the Cisco router, and then the only thing that the Internet can get to are three Unix machines that are on our open subnet," Holzgraf said. "Those are the only machines that are accessible to or from the outside world because the router effectively says that everything that comes in this serial line from the Internet can go to that subnet, and that's all."

Each server on the subnet is used exclusively for Internet access. One is used for E-mail, another for file transfers and a third for receiving and disseminating news feeds. Mentor does not keep any other information on those open machines, Holzgraf said.

The router also manages internal Internet access, so Mentor can track who is using the Internet and for what purposes. "No one from the inside can get out to the Internet without going through one of those trusted machines," he said.

Although the configuration provides first-rate security and performance, it is costly, requiring dedicated Unix servers.

Dial-up SLIP connections to an Internet access provider offer a solution for companies that are not Unix-savvy.

"Obviously, most people have Novell LANs," Greenfeld said. "These companies either don't have Unix, or if they do, they don't necessarily want to dedicate a Unix box just for Internet access."

But Greenfeld cautioned that for large-scale corporate deployment, individual SLIP connections "would be just a mess" for the network manager.

"There would be no control, lots of phone lines and lots of software — and it still just gives you dial-up access, at best. If you're a company of any size with a bunch of people who want to get access, you need a server," he said.

Currid concurred, but said that as full of problems as they can be, dial-up SLIP connections still may be the only viable solution for some shops.

"If the demand is limited and there aren't too many people who absolutely, positively need to use it right now, give them a SLIP connection," together with TCP/IP software and Internet navigation software. "Put a 14.4K bit/sec modem at the desktop and give them a phone line on a temporary basis," Currid said.

"That will put out the fires of desire temporarily, but by no means should anybody consider that more than a Band-Aid because it's absolutely the wrong way to do it," she said, adding that the number of connections can easily get out of hand as more users demand access.

"Most people have Novell LANs. These companies either don't have Unix, or if they do, they don't necessarily want to dedicate a Unix box just for Internet access."

Currid also said SLIP connections are relatively bulletproof since they are made via modems.

And those net managers who don't want to bother with a Unix server or dial-up SLIP connections can turn to an Internet access provider. "There are companies who will help people get on the Internet," Greenfeld said. "For instance, BBN Internet Services Corp. will put a server on its network and configure it for your company and applications. Usually, it's a PC running Unix, but [BBN] can hand-hold a company and get it on the Internet."

Most Internet service providers, however, are not much help, he said.

"They give you access, so you have a number to dial and a node to call," Greenfeld said. "But they don't help you set up your own software, and they don't help you get your situation set up."

Internet service providers are like electric utilities, he said. "They give you a plug, but they don't tell you anything about what you do with it. They'll just tell you how much electricity you can get and how much it costs."

Currid added, "There just isn't a win-win to this yet. Either you go with Unix, which may be difficult for most people, or you go with this temporary workaround with the SLIP connections. And most IS managers will roll their eyes back when you say 'temporary workaround' because they'll say, 'Yeah, like the one I put in in 1978 and we're still supporting.'"

➺ Cummings is a freelance writer based in Marlborough, Mass.

NEST

Continued from page L1

to NEST, called Microsoft at Work, which was designed to give personal computers direct access to copiers, fax machines and other office equipment. But it has attracted little support because it lacked networking support and ran only on Intel Corp.-based hardware.

TRIPLE-DECKER

NEST is a three-tiered, mini-operating system comprising a Connectivity Layer that supplies transport and services at the Open Data-link Interface (ODI) level; a NetWare Services Layer that lets devices behave as NetWare clients; and an Application Layer that runs on top of the other two to access NetWare print queues and other functions.

NEST is written in C code, allowing it to be ported easily across different hardware platforms. It also includes an application program interface that developers can use to link it to the proprietary embedded operating systems found in some specialized devices.

The Connectivity Layer includes an IPX/SPX stack sitting atop ODI, which handles device-level connectivity, such as Ethernet and Fiber Distributed Data Interface links.

The NetWare Services Layer gives NEST devices access to NetWare Directory Services, file and print services, and other services. The NEST requestor builds packets and adds logon authentication to packet transfers.

The NEST SDK, which includes documentation, source code, test tools, training and support, costs $50,000 for five developers and 25 beta-test end users. OEMs will pay royalties beyond that license for every NEST device they ship.

©Novell: (800) 638-9273.

{The MultiNet® Hub}

OUR COMPETITORS SAY they *have* enterprise switching hubs. Here are some more *good stories.*

Fact is, LANNET is the only company actually shipping an enterprise switching hub. And what a hub it is. With LANswitch® modules, the MultiNet lets you switch up to 128 dedicated 10 Mbps Ethernet connections, 64 Ethernet segments, or add 100 Mbps server and backbone links — that's enough switching capacity for a whole campus network. You can mix Ethernet, Token Ring, FDDI, routing and high-speed switching on the same platform. And talk about an easy migration path to ATM — just add new modules. Here's some believable reading — the MultiNet doubled the throughput record with no packet loss in the Harvard University internetworking lab test. Success the competition can only fantasize about. CALL 800-778-7427, dept. 125 for our top lab results and find out how to get a free evaluation. Or send an e-mail to datacom3@hq.lannet.com

LANNET

The Open Framework for Network Solutions.

17942 Cowan Avenue, Irvine, California 92714. ©1994 LANNET. MultiNet and LANswitch are registered trademarks of LANNET. All other trademarks are the sole property of their respective companies. Developer tested only. Novell makes no warranty with respect to this product.

yes
It runs with NetWare

See us at NETWORLD+INTEROP 95 BOOTH 2604

*Circle Reader Service #***14**

New Interphase ATM cards may put pricing pressure on market

BY MARGARET DORNBUSCH

Dallas

Interphase Corp. last week introduced low-cost Asynchronous Transfer Mode client and server adapter cards that could put pressure on other vendors to lower their prices.

The Interphase 5515 Peripheral Component Interconnect (PCI) ATM adapter, priced at $650 for copper connections and $850 for fiber links, is designed for servers and high-performance desktop machines.

According to Greg Iverson, Interphase's vice president of marketing, the adapter cards are priced from several hundred dollars less to half as much as competing products on the market.

Inverson is hoping the low-priced adapters will help convince users to give ATM a try at the desktop. The technology has been perceived as mainly for backbone or campus nets until pricing comes down, he said.

Charlie Robbins, vice president of communications research for Aberdeen Group, Inc. in Boston, said Interphase's adapters may not spark a price war. But they should put pressure on other vendors to lower prices as manufacturing volumes grow, he said.

"ATM doesn't have to be a rich man's technology," he said.

Aside from price, standards compliance and compatibility with other vendors' software and hardware make the Interphase adapters attractive, Robbins said.

The adapters support Internet Engineering Task Force RFCs 1483 and 1577 for IP traffic over ATM as well as the ATM Forum's User-Network Interface 3.0 specification for signaling and LAN emulation draft standard, Iverson said. LAN emulation allows ATM nets to support applications initially written for shared LANs such as Ethernet and token ring.

The 5515 also comes with drivers for Windows NT and Novell, Inc. NetWare 4.X servers.

The 5515 will give desktop users access to ATM switching gear from 14 vendors, including Bay Networks, Inc. and Fore Systems, Inc.

The adapter is due in March.

Interphase already offers 155M bit/sec ATM cards for Sbus and VME machines.

©Interphase: (214) 919-9000.

Digital

Continued from page L1

bit/sec V.34 modem standard with compressed throughput up to 115.2K bit/sec. ISDN Basic Rate Interface connectivity is being considered, as well.

The NetRider system includes remote node and remote control client software licensed from Stampede Technologies, Inc. for AppleTalk, IP and IPX. The remote access servers also come with a Mosaic Internet browser licensed from SpyGlass, Inc.

Digital is entering the remote access market with a bundled hardware, software and application package that costs about one-third less than comparable offerings from other vendors, said Bill Maro, Digital's vice president of product marketing and engineering.

"The smaller niche players who have it say ISDN is incredibly important."

The eight-port NetRider 90 costs $3,400, and the 32-port NetRider 9000 costs $9,345.

"Their cost per port sounds good, but with their bundling its hard to do an apples-to-apples comparison," said Kitty Weldon, an analyst at The Yankee Group in Boston. "I'm sure their competitors would have much to say about it."

The issue for Weldon has to do with NetRider's appeal to customers beyond Digital's installed base.

"In terms of network scalability — the ability to add this product to your DECserver or DEChub — it will certainly attract their installed base," Weldon said. "But their price and their bundling of all you really need to get started should draw new users, as well."

The fact that Digital is not supporting ISDN access right away is probably not a stumbling block, Weldon said.

"The smaller niche players who have it say ISDN is incredibly important," she said. "But a larger company like Digital that isn't concerned that it has already lost a year getting into this market is more likely to say ISDN hasn't reached critical mass yet at all."

As a DECserver software upgrade, NetRider costs $1,295, $2,350 and $3,900 for eight-, 16- and 32-port versions, respectively. All NetRiders require separate modem support.

©Digital: (800) 344-4825.

With the AIWA AutoLoader, worries about tape backup will never again affect your concentration on more pressing matters.

Reliable, automated tape backup with a 17-cartridge magazine for maximum capacity

Package the total server storage solution! *Combine the AIWA AutoLoader with the COREarray 20000 RAID Subsystem for the ultimate high-performance, fault-tolerant storage management system (shown with a typical server).*

All company and product names are the property of their respective organizations.

Automated, high-capacity tape backup puts an end to your daily backup chore and the worry that comes with it

Tape backup shouldn't be an everyday task, and it shouldn't invite human error. The AIWA AutoLoader lets you leap to a more advanced and reliable backup strategy — one that stretches your backup interval to a month or longer (up to 39 weeks)! Available in two configurations (AL-D210 single DDS drive and AL-D220 dual DDS drive), the AutoLoader delivers high capacity (up to 272 GB with 4:1 data compression), simple operation, and compatibility with the feature-rich software you need, including Arcada, Cheyenne, Novastor, Palindrome, and Dantz.

Better cartridge management: By automating cartridge loading, the AutoLoader will drastically reduce your cartridge maintenance, eliminate operator error in cartridge handling, and simplify cartridge tracking and control.

An investment that lasts: Escape the limitations of single-cartridge backup with a reliable, 17-cartridge, high-capacity solution that will handle your backup requirements for years to come.

Low cost, high value: Only five cents per MB (2:1 data compression), the AutoLoader is priced below the competition, and is a better value than 8 mm solutions for mission-critical applications.

Advanced performance: The AL-D220 dual drive version features parallel streaming for a 87.5 MB/min. sustained transfer rate (burst transfer rate up to 5 MB/sec.), independent drive operation, and fault tolerance (one drive continues operation if the other fails).

Jump ahead to the industry's most advanced tape backup solution: contact your distributor or call AIWA or CORE, now!

U.S. Representative for AIWA AutoLoader

CORE INTERNATIONAL
AN AIWA COMPANY
800-920-2673

aiwa
AIWA AMERICA, INC.
Computer Systems
201-512-3606

MERISEL
1 800 MERISEL

ATG
INTELLIGENT ELECTRONICS
ADVANCED TECHNOLOGY GROUP

Tech Data
CORPORATION

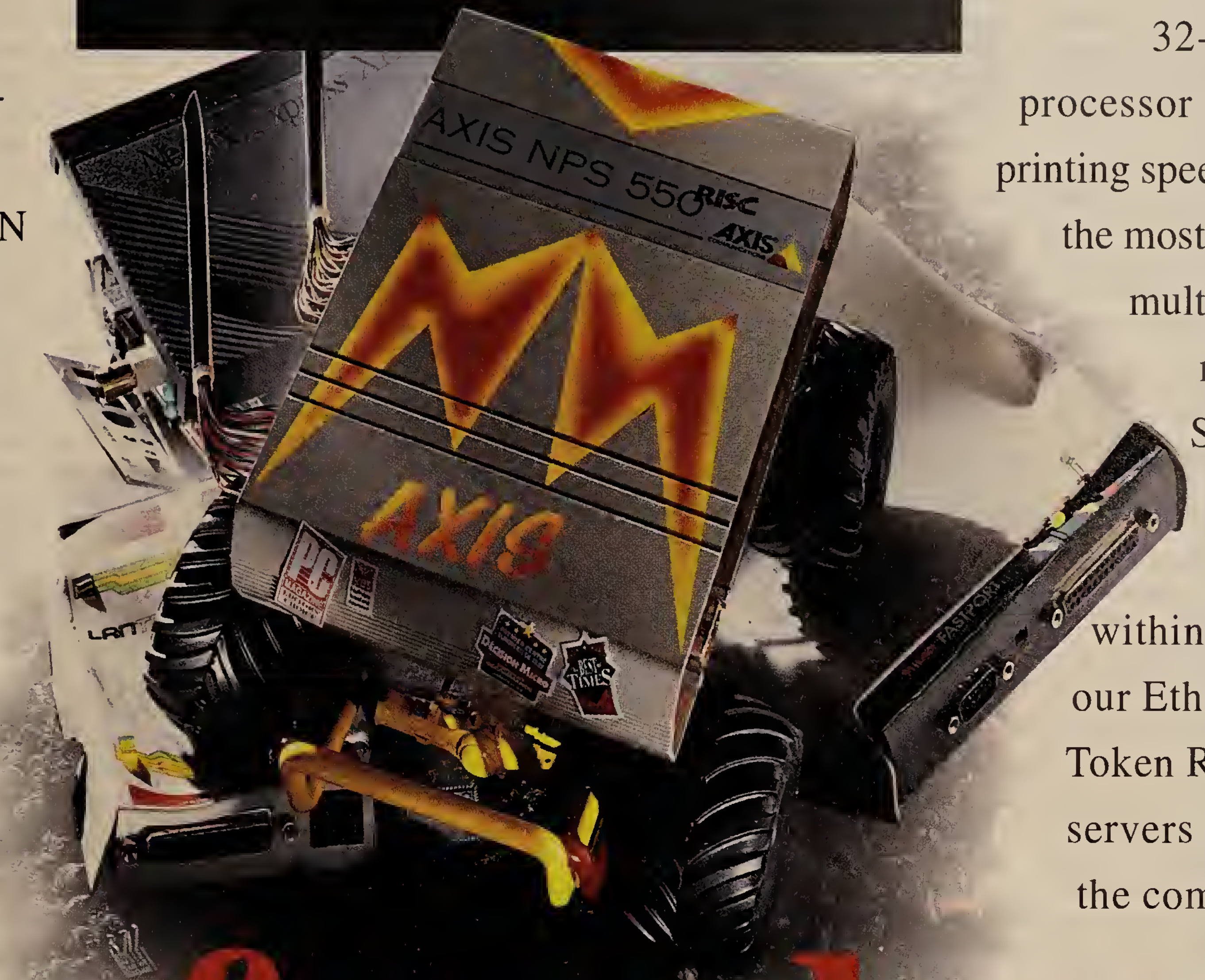
See us at Networks Boston, Booth 2430

Circle Reader Service #9

Introducing the award-winning print servers that run down the competition.

Awe-Inspiring Power.

Axis NPS Ethernet print servers have smashed the competition in reviews from BYTE magazine, LAN Times, PC Magazine and Decision Micro. And now that we've put the same technology into our Token Ring multiprotocol print servers, IBM sites can reap the benefits, too.



Eat-Dust Performance.

Our integrated 32-bit RISC processor optimizes printing speed in even the most torturous multiprotocol networks. Starting at $395 and installed within minutes, our Ethernet and Token Ring print servers demolish the competition.

Care for a demo?

1-800-444-AXIS

Axis print servers support the widest variety of protocols in the market – including NetWare, TCP/IP, Windows NT, LAN Manager, LAN Server, and EtherTalk. They have the power of full SNMP management. And they revel in being the most efficient way to handle printer sharing on a LAN.

yes
NetWare Tested and Approved
AXIS NPS 650 AXIS
AXIS NPS 530
AXIS NPS 630
MasterCard
Ethernet and Token Ring starting at $395

Put the Pedal to the Metal.

Call 1-800-444-AXIS to qualify for an evaluation unit and for our definitive guide on **"Open Network Printing."** Isn't it time *your* network printing had some muscle to it?

AXIS®
COMMUNICATIONS
Lund – Boston – Tokyo – Hong Kong

Axis Communications, Inc., 4 Constitution Way, Woburn, MA 01801. Voice: (617)-938-1188 Fax: (617)-938-6161
All trademarks are the properties of their respective companies.

Circle Reader Service #4

Getting tuned in to Ethernet switches

BY DAVID AXNER

Ethernet switches give network managers the potential to drastically improve overall LAN performance, so it's imperative they understand the general concepts of the technology and all that it enables.

Ethernet switches sprang to life in March 1990 when Kalpana, Inc. of Los Gatos, Calif., began offering a fast multiport device with low latency. Despite its resemblance to a multiport bridge, the device was called a LAN switch by the firm because it used a cross-point switch matrix to forward packets.

Since Kalpana debuted its original EtherSwitch, scores of vendors have introduced similar products. Like bridges, these devices operate at Layer 2 of the Open Systems Interconnection reference model.

An Ethernet switch examines each arriving packet's source and destination media access control (MAC) layer addresses, and compares them to a dynamic address table. The switch adds previously unidentified source addresses to the table and sends the packet to the appropriate destination port.

Most Ethernet switches also are characterized by their ability to pass any net protocol, to filter traffic at the switched port, to prevent bridging loops and to provide redundant links.

What's more, Ethernet switches are transparent to the network. Network managers can insert them into an existing network without making any changes; they don't need to rewire, add adapter cards or change interface cards, for instance.

SWITCHING MODES

Ethernet switches pass packets between source and destination ports using either cut-through or store-and-forward techniques.

Switches that use the cut-through mode send packets to their destination ports as soon as they read the MAC address. Some refer to this technique as switching packets on the fly since the switch does not wait to receive the whole packet before it forwards it.

This switching technique is faster than the store-and-forward method but not as accurate because it does not check the whole packet for errors. Switches that use the store-and-forward mode scan the entire packet for cyclic redundancy check errors, for packets shorter than 64 bytes and for excessively long packets.

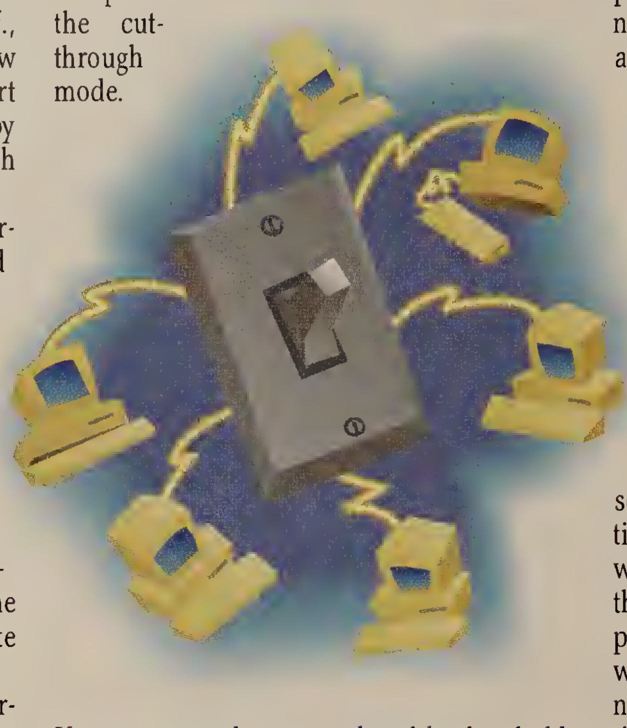
The store-and-forward method must be used when passing packets between ports operating at different speeds. The speed change requires buffering so the switch does not drop packets passed at 100M bit/sec to a 10M bit/sec port, for instance.

Most Ethernet switches only use the store-and-forward switching technique. Kalpana's EtherSwitch, Grand Junction Networks, Inc.'s FastSwitch 10/100 AG and Amber Wave Systems, Inc.'s AmberSwitch are exceptions.

The EtherSwitch uses the cut-through method, while the FastSwitch 10/100 AG and the AmberSwitch implement both.

Grand Junction of Fremont, Calif., lets network managers decide whether they want the FastSwitch to operate in the cut-through or store-and-forward mode. Amber Wave of Acton, Mass., uses a patented technique that lets the AmberSwitch adaptively select either mode on a port-by-port basis.

Upon power-up, the AmberSwitch defaults all ports to the cut-through mode.



If errors exceed a user-selectable threshold, the switch shifts to the store-and-forward technique on a per-port basis. The port reverts to cut-through mode when errors drop below the threshold.

Amber Wave, like Grand Junction, also will let network managers set the switching mode for each port.

Ethernet switch performance is measured in filtering and forwarding rates of packets per second. Filtering rates are typically wire speed, or 14.8K packet/sec. Forwarding rates vary: Port forwarding rates may be at wire speed, but the aggregate switch forwarding bandwidth may be less than the aggregate wire speed of all ports.

Switching is performed in hardware, typically by application-specific integrated circuits for high-speed, low-latency switching and shared memory architecture.

SWITCHING ADVANTAGES

Ethernet switches provide two major advantages. First, Ethernet switches relieve network congestion and curb performance degradation by eliminating the bandwidth sharing among devices attached to conventional Ethernet segments. They provide full bandwidth at each port so each user station or network server has access to 10M, or in some cases, 100M bit/sec, of Ethernet bandwidth.

Network managers who do not want to provide each end station with the full bandwidth can designate a certain number of users to each port. Microsegmentation improves the performance of conventional shared LANs since network managers can control how many users share the bandwidth.

In addition, the switch acts as a firewall to block broadcast packets between segments. However, the switch will pass packets from a device on one segment to a station on another segment if the packets carry the appropriate address.

Second, switches let more than one station send packets at a time, overcoming a limitation of conventional Ethernet.

Ethernet switches support multiple concurrent transfer paths between different port pairs. Each pair of switch ports can simultaneously transfer a packet between two attached user stations at the full Ethernet bandwidth.

For example, a 24-port switch can support 12 concurrent paths between 24 attached devices, for a maximum throughput of 120M bit/sec. However, the switch will block packets if it does not have the forwarding capacity to handle the required 120M bit/sec for 12 concurrent 10M bit/sec switch paths. If so, not all paths between different port pairs can be active simultaneously.

Blocking also can occur when multiple source ports pass packets to a single destination port. In this case, the forwarding bandwidth is limited to the 10M bit/sec capacity of the destination port. The switch will pass the packet from the first source port at full bandwidth and buffer other packets until the destination port is free to accept them. This condition, which limits performance, can occur when a server is attached to a switch port.

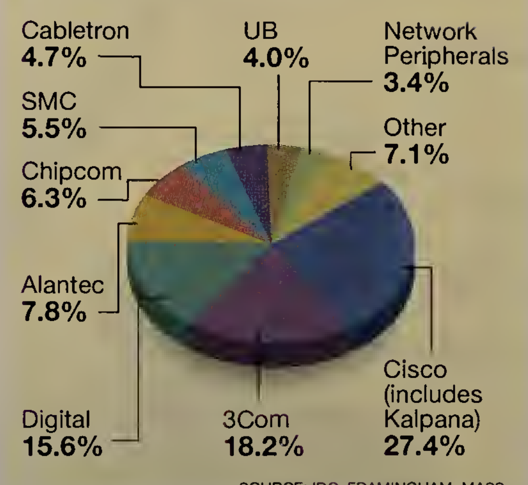
In the event of inadequate buffer capacity, packets can be lost. Substantial buffer capacity can help avoid this situation; however, adding buffer capacity will increase delay for the queued packets. Too much buffering can result in unacceptable delay.

The implementation of 100M bit/sec ports offers a solution to the multiple-source, single-destination blocking limitation. For instance, network managers can attach servers to 100M bit/sec ports. Multiple 10M bit/sec ports can then access the servers without degrading performance.

In addition, network managers can mesh Ethernet switches by connecting 100M bit/sec ports.

Major Ethernet switch players

Revenue share for 1994, based on $327 million worldwide total



SOURCE: IDC, FRAMINGHAM, MASS.

To provide high-speed switching, vendors typically use the standards-based Fiber Distributed Data Interface, since it is readily available. But some use or plan to offer 100Base-T, which is the fast Ethernet draft standard, or Asynchronous Transfer Mode connections.

BUILDING A VIRTUAL LAN

Some Ethernet switches let network managers create and quickly reconfigure virtual LANs. Using this technology, they can segment networks into logical workgroups independent of physical connection and location. Workgroups can be defined according to project or department, for instance.

Workgroup members on a virtual LAN can collaborate and share computer resources, but they cannot communicate with participants of another logical workgroup unless the two nets are bridged or routed. In this manner, access to specific servers containing sensitive data is restricted to all but the assigned workgroup.

Broadcast packets also are confined to a specific virtual LAN so they cannot propagate throughout a network and increase traffic congestion.

With switched virtual LANs, a network manager can assign groups of switch ports to different logical subnets. With basic virtual LANs, they can assign workgroups to one or more port numbers. For example, network managers can designate Workgroup A to switch Ports 1 through 3, Workgroup B to switch Ports 4 and 5, and Workgroup C to Ports 6 through 9.

When several switches are linked in a network, a virtual LAN can be spread across ports on all the different switches. For example, a single workgroup may be assigned to Ports 3, 5 and 8 on one switch; 2, 6 and 12 on another; and 4, 7 and 12 on a third switch.

More sophisticated virtual LAN designs use MAC addresses for workgroup assignment. This approach adds security since network access privileges can be assigned to specific MAC addresses. Unauthorized users are prevented from accessing certain net resources even though their station changes ports.

A greater degree of sophistication is provided when IP addresses are used to define logical workgroups.

MANAGING SWITCHES

Ethernet switches can be managed using out-of-band or inband management. Out-of-band management is performed on a local terminal directly connected to the switch. The inband capability, conducted via Simple Network Management Protocol-based systems, enables network management from a central location.

For SNMP inband management, the switch must support an SNMP agent and Management Information Base that contains the switch's operating characteristics.

Virtual LAN management is either incorporated into the main management system or provided via add-on software.

Some vendors, such as Cisco Systems, Inc. and 3Com Corp., also support the Remote Monitoring specification.

In general, Ethernet switches can help network managers combat increased traffic loads and better accommodate an unwieldy and growing number of users. It behooves prospective users to carefully evaluate switches for appropriate port capacity and features.

Network managers should pick a switch, either modular or stackable, that can grow with their needs.

➾ Axner is president of DAX Associates, an internetworking consulting firm located in Oreland, Pa. He may be reached by phone or fax at (215) 886-1820.

FREE Information

on the latest products and services advertised in *Network World's* LAN WORLD section.

✯ Please answer questions 1 to 4 and complete the name and address information below.

✯ Circle the numbers beside each of the companies from whom you would like to receive free literature.

✯ Then, simply fold, tape the bottom edge closed, and drop it in the mail for your free literature.

1. Action requested

1 ☐ Request for sales call
2 ☐ Request for proposal
3 ☐ Request for information

2. Purchase timeframe

4 ☐ Within 60 days
5 ☐ Within six months
6 ☐ Within one year

2/13/95

3. Scope of purchase responsibility

7 ☐ Enterprise wide
8 ☐ Departmental

4. Purchase influence/ number of sites

9 ☐ one site
10 ☐ 2-9 sites
11 ☐ 10-20 sites
12 ☐ 21+ sites

Name ____________________

Title ____________________

Company ____________________

Street ____________________

City __________ State ____ Zip ____

Phone __________ Fax __________

1 **FUNK SOFT WARE**

Funk Software develops WanderLink, the new high-performance remote access software for NetWare networks. .

2 **PSIBER® Data Systems Inc.**

Produces the most advanced line of non-intrusive tools for network professionals. ***psiberNET*** is the first connectionless LAN Monitor that makes trouble calls less trouble.

3 **CORNING**

The world's most consistent optical fiber. Easy installation, low-loss splices, low attenuation rates. You can count on Corning.

4 **AXIS™ COMMUNICATIONS**

Axis Communications, Inc. develops printer communications products for local-area network-based Ethernet and Token Ring environments, IBM mainframes, and AS/400 midrange systems.

5 **Kléver Networking Products**

Check out the KleverHUB Family today — more features, more ports — less space, less cost.

6 **ADC Kentrox®**

Make Technology Practical – and Affordable – call ADC Kentrox for network access solutions to 56K, T1/FT1, E1, T3 and E3 carrier services including – Frame Relay, SMDS and ATM.

7 **AMP**

Multi-media network solutions include connectors, active/passive devices, patch panels, cables and accessories from AMP.

8 **SANYO ICON**

Ultra high performance RAID storage from the leader in Intelligent Disk Subsystems for enterprise networks.

9 **CORE INTERNATIONAL** AN AIWA COMPANY

CORE International, Inc. offers high-performance storage solutions, including COREarray open, scalable disk array subsystems; high-performance COREdisk hard drives from 1 GB to 9 GB; and COREtape tape backup drives.

10 **CONNECT with Rockwell**

Rockwell Network Systems provides high speed data communication products for desktop and remote access connections, featuring money-saving Link Optimization. Call us at 800-262-8023 for more information.

11 **TELCO SYSTEMS**

The Access 30™ Multiport CSU/DSU provides cost-effective access to network services.

12 **VERILINK**

Respond with built-in flexibility. Call Verilink for T1/FT1, E1, T3/E3, SMDS, Frame Relay, and ATM network access solutions.

13 **ALANTEC** Intelligent Switching Hubs

The PowerHub family of intelligent switching hubs provides flexible bandwidth for the most demanding LAN applications.

Send for

☆**FREE**☆

Information

on the latest

products

and **services**

advertised in

LAN WORLD

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO.716 PITTSFIELD,MA

POSTAGE PAID BY ADDRESSEE

NETWORK WORLD
P.O. Box 5090
Pittsfield, MA 01203-9838

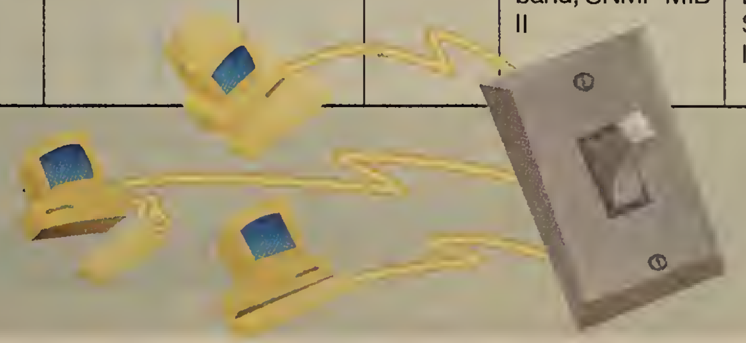
PLEASE **fold** AND **tape** ALONG THIS EDGE.

A sampling of Ethernet switches

Company and product	Hub type	Switch mode	MAC address storage	Maximum ports	High-speed ports	Buffer capacity	Filter/forward rates (packet/sec)	Bridging and routing	Support for virtual LANs	Network management	Price per port	Delivery plan
Alantec PowerHub 7000	Modular: 5, 10, 15 or 20 slots	Store-and-forward	8,192 aggregate	240 or 456 10Base-T	48 fiber or 128 UTP FDDI	2M bytes per port or per switch	14.8K/800K aggregrate	802.1d; AppleTalk, DECnet IV, IP, IPX	Yes, up to 256	Inband, out-of-band	$250-$883	Sept. 1994
Amber Wave AmberSwitch	Modular: 5 slots	Adaptive store-and-forward; cut through	4,096 aggregrate	8 to 32 10Base-T	None	256K bytes per 8 ports	14.8K/116K per 8 ports	802.1d	Yes, up to 16	Inband, out-of-band, SNMP MIB II	$150	Not available
Bay Networks LattisSwitch 28000	4 stand-alone models	Store-and-forward	8,192 aggregate, 1,024 per port	8 fiber or 16 10Base-T, or 16 10M/100M bit/sec	2 or 8 100Base-T	256K bytes shared	14.8K/2.9M aggregrate	802.1d	Yes	Inband, out-of-band, SNMP MIB II	$900-$942	1Q to 3Q 1995
Cisco Catalyst	Stackable	Store-and-forward	1,024 aggregate, or 4,000 aggregrate Ethernet or FDDI	8 10Base-F or 10Base-T	1 DAS fiber or UTP FDDI	4M bytes shared	14.8K/118.4K	802.1d; IP	Yes	Inband, out-of-band, SNMP MIB II, RMON support for 9 groups	$1,200-$1,449	Feb. 1994
Grand Junction FastSwitch 10/100 AG	Stackable: up to 8 hubs	Cut-through or store-and-forward	30, 1 per port	25 10Base-T	5 100Base-T	1.5M byte per port or 3M bytes shared	14.8K/462K for 10Base-T; 14.8K/144.4K for 100Base-T	Filtering and learning	No	Inband, out-of-band, SNMP MIB II	$260 for 10Base-T	June 1994
Kalpana EtherSwitch	Stackable: 2015 RS; Modular: 2115 M	Cut-through	6,000 aggregrate, 1,700 per port	15 to 60 10Base2, 10Base-F or 10Base-T	None	500K bytes per port	14.8K/223.2K	802.1d	Yes, up to 7	Inband, out-of-band, SNMP MIB II	$500-$567 (for stackable model)	May 1994 for the stackable; Nov. 1994 for the modular
NetVantage NV7500	Stackable: up to 4 hubs	Store-and-forward	16,000 aggregrate	8 to 32 10Base-T, including 1 AUI per hub	1 DAS fiber or UTP FDDI	1.5M byte shared	14.8K/120K	802.1d	Yes	Inband, out-of-band, SNMP MIB II	$400	Oct. 1994
PlainTree WaveSwitch 100	Modular	Store-and-forward	1,024 aggregrate	16 10Base-T	2 SAS or DAS FDDI, or 2 100Base-T/100VG-AnyLAN	128K bytes per 4 ports; 512K bytes aggregrate	14.8K/150K	802.1d	No	Inband, out-of-band, SNMP MIB II	$594	Feb. 1995
Proteon ProNet E Series	2 stand-alone models	Store-and-forward	1,024 aggregrate	8 or 16 10Base-T, plus 1 AUI	1 SAS or 2 DAS FDDI	128K bytes per port; 2M bytes shared	14.8K/14.8K	802.1d	No	Inband, out-of-band, SNMP MIB II	$475-$594	Nov. 1994
Retix SwitchStak 5000	Stackable: up to 8 hubs	Store-and-forward	3,072 aggregrate	8 to 64 10Base-T, including 1 AUI or 10Base-T per hub	None	32K bytes per port; 128K bytes stackbus port	14.8K/35K	802.1d	Yes, up to 32 pairs of port-based network groups	Inband, out-of-band, SNMP MIB II	$499-$599	June 1994
SMC TigerSwitch	Stand-alone	Store-and-forward	8,192 aggregrate	24 10Base-T, plus 1 AUI	None	1M byte shared	14.8K/178.6K	802.1d	Yes	Inband, out-of-band, SNMP MIB II	$394	Nov. 1994
3Com LANplex 2000	2 stand-alone models	Store-and-forward	8,000 aggregrate	16 10Base-T	2 FDDI (in Model LP 2500)	4M bytes shared	14.8K/565K for 10Base-T; or 14.8K/445K for FDDI	802.1d; IP	With port, address and IP routing	Inband, out-of-band, SNMP MIB II, RMON support for 9 groups	$562; $699	Jan. 1995
Xnet ParallelSwitch	EISA/ISA DMA Busmaster server card	Store-and-forward	8,000 aggregrate	6 10Base-T or 10Base2	60M bit/sec server port	150K bytes per port	14.8K/14.8K	802.1d	No	Inband, out-of-band, SNMP MIB II	$331 for EISA; $498 for ISA	June 1994

AUI = Attachment unit interface
DAS = Dual Attached Station
DMA = Direct memory access
EISA = Extended ISA
ISA = Industry Standard Architecture

MIB = Management Information Base
RMON = Remote Monitoring
SAS = Single Attached Station
UTP = Unshielded twisted pair



ATM25 is the way to go for desktop connections

BY KINGSTON DUFFIE

Duffie is chief technology officer and vice president of engineering at Whitetree Network Technologies, Inc. in Palo Alto, Calif., and a representative of the Desktop ATM25 Alliance.

VENDOR VIEW

The ATM Forum Technical Committee made a smart move last week when it approved the 25.6M bit/sec Asynchronous Transfer Mode proposal.

The technology, known as ATM25, is an exciting desktop option that meets the cost and performance needs of mainstream corporate users.

It offers net managers the most attractive way to bring ATM to desktops wired with common unshielded twisted pair-3 (UTP-3) cable.

ATM25 already is more widely available than the forum-approved 51.84M bit/sec standard and more cost-effective than the 25.9M bit/sec proposal it had competed against for approval.

ATM25's origins date to 1993, when the ATM Forum began evaluating ways to provide ATM to the desktop over UTP-3 copper wiring. The 25.6M bit/sec spec was one of two proposals. An adaptation of token ring, ATM25 uses a simple 4B5B encoding scheme that provides throughput of 25.6M bit/sec over shielded twisted pair, and UTP-3, -4 and -5 wire.

The other proposal is based on the Synchronous Optical Network (SONET) Synchronous Transport Signal-1 standard. It achieves a throughput rate of 51.84M bit/sec over UTP-3 cable through a technology called Carrierless Amplitude Modulation/Phase Modulation-16.

LEFT BEHIND

Deciding to proceed with only one of these proposals, in mid-1993 the ATM Forum standardized the 51.84M bit/sec approach. At that time, it seemed a reasonable choice since it satisfied the UTP-3 requirement and was more consistent with the forum's work on a SONET-based interface for carrying ATM data over fiber-optic cable at 155M bit/sec.

But more than a year later, no vendors had announced products that incorporated the 51.84M bit/sec standard.

Meanwhile, the ATM focus began to shift from technical feasibility to price and availability. So more than 30 vendors teamed as the Desktop ATM25 Alliance to once again push the 25.6M bit/sec proposal.

After tweaking the specification, the group resubmitted the proposal to the ATM Forum last September.

In November, another group of companies asked the forum to consider a proposal for ATM to the desktop at 25.9M bit/sec. The specification is similar to the 51.84M bit/sec standard because it uses SONET framing, but it has a different line coding scheme.

With two new proposals before it, the ATM Forum last December reversed its decision to limit the options for mid-range speed standards. Its focus has now shifted from the feasibility of ATM over UTP-3 to cost and time to market.

THE BEST CHOICE

Alliance members are confident in 25.6M bit/sec. They feel that ATM25 satisfies key requirements such as price, availability, performance and interoperability better than the competing proposal.

A simple technology, ATM25 is priced comparably to Ethernet and token ring. Users can get a desktop ATM25 connection, including an adapter card and hub port, for about $1,000. They already have plenty of 25.6M bit/sec products — including adapters, concentrators, peripherals, switches and testers — from which to pick.

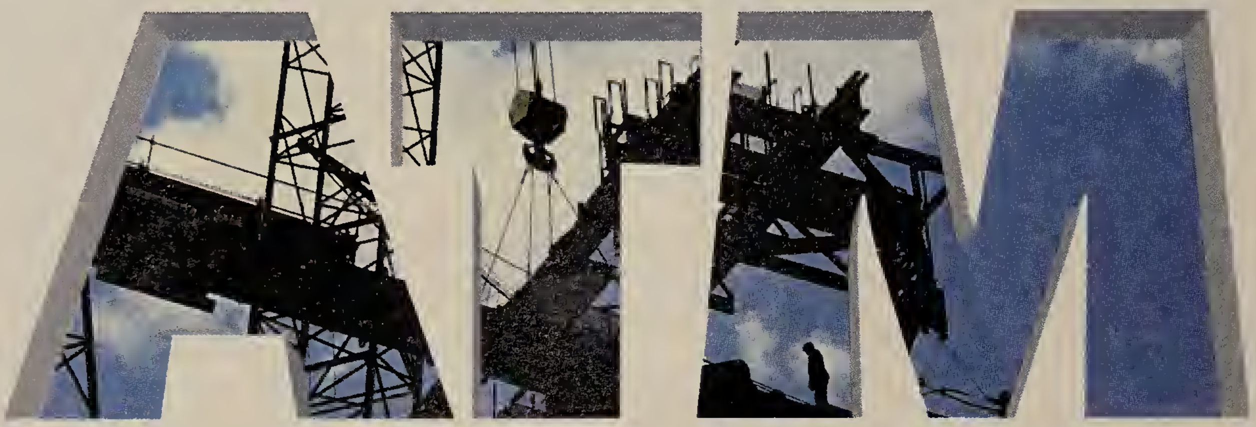
At full-duplex 25.6M bit/sec, this technology provides much higher data throughput than Ethernet. In addition, it incorporates the abilities for worldwide seamless networking and quality-of-service guarantees crucial to new applications such as desktop conferencing and video on demand.

What's more, Desktop ATM25 Alliance members are committed to delivering interoperable products based on the current 25.6M bit/sec specification. In fact, several companies already have tested the interworking of their products.

It does not matter that the ATM25 technology is not SONET-based since SONET framing never traverses an ATM switch. The features of SONET, which was designed for wide-area telephone networks, have no benefit on the 100-meter link between a wiring closet and a corporate desktop.

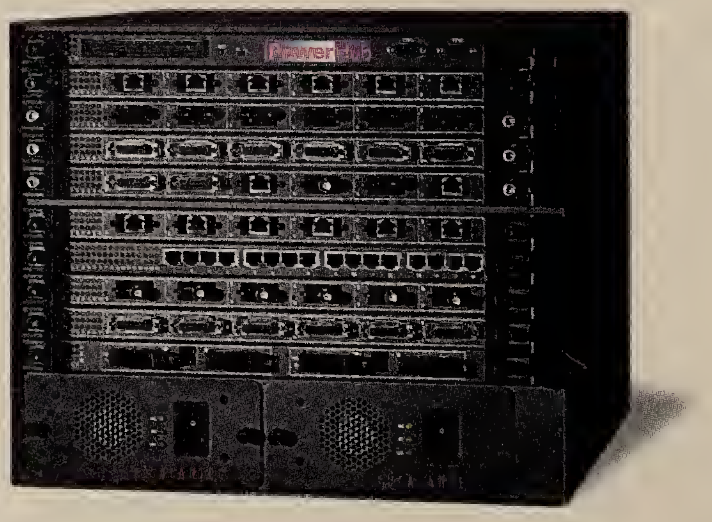
Like Ethernet a decade ago, ATM25 provides a way to create a new generation of corporate networks. But to do so, it must do away with pricing, availability, performance and interoperability concerns at the desktop.

ATM25 accomplishes this. The other desktop ATM plans don't. ☒



Real soon.

Running out of bandwidth? Alantec PowerHubs® can deliver all the Ethernet and FDDI bandwidth you're likely to need right now at an extremely reasonable cost. And when you're ready for ATM, you can plug it right in. **Call 1-800-ALANTEC** for information on our 30-day free trial evaluation program.



Real now.

ALANTEC™
Intelligent Switching Hubs
70 Plumeria Drive • San Jose, CA 95134 • Phone: 408-955-9000 • Fax: 408-955-9500

See us at Networks Expo Boston

©1995 Alantec Corporation. PowerHub is a registered trademark of Alantec corporation. Alantec products are available under GSA schedule GS00K-94-AGS-5480.

In the turbulent world of network cabling, where can you turn for help?

Turn to us.
AMP now offers complete design, installation, certification, warranty, and after-sale support of premises cabling systems – with some very special advantages.

AMP NETCONNECT Open Cabling Systems are based on ISO/IEC and EIA/TIA standards and recommendations. And because we're AMP, you get total flexibility in the choice of media and distribution. If your system requirements include fiber, UTP, coax, or a mix, we'll meet your needs, all within globally established standards and recommendations.

After installation by an Authorized NETCONNECT Design and Installation Contractor, your system will be tested and certified to meet the link performance of the same standards – that it actually operates to spec, at rated speed. And we provide a 15-year warranty on performance. Your cabling will meet your current needs, and will be there for you in the future when new hardware and new user demand require it.

We'll be there for you in the future, too – with all the help you need in the management and growth of your system. We offer phone support for remote diagnostics. And we provide on-site help for everything from major expansion to routine adds, moves, and changes. We also provide training and certified NETCONNECT Designers and Installers to perform warranty work and dispatch service. If you needed this level of service before, you had only one vendor to turn to; now you have a choice. Make the smart one. Call us today.

AMP and NETCONNECT are trademarks.

For more information, on AMP NETCONNECT Open Cabling Systems,call us at 1-800-722-1111 and ask for the Network Action Center. AMP, Harrisburg, PA 17105-3608. In Canada call 905-470-4425.

AMP

Circle Reader Service #7

Saber bundles LAN mgmt. tools, offers help desk link

Firm follows tool packaging trend with LMS.

BY JOANNE CUMMINGS

Dallas

Saber Software Corp. has announced it is combining four of its software tools in a single, comprehensive LAN management system for Novell, Inc.'s NetWare environments.

The bundle, called Saber LAN Management System (LMS) for NetWare, provides functions such as centralized file and software distribution, automatic software and hardware inventorying, and remote client control.

Saber's decision to package the tools follows similar moves by other vendors, including Microsoft Corp. and Novell. Microsoft bundles different management software in Systems Management Server, and Novell, in conjunction with Intel Corp., does so in ManageWise.

"It's a smart move," said Matt Cain, program director at META Group, Inc., a Stamford, Conn., consultancy. "Since many of these tools are linked together anyway, like software distribution and inventory management, it makes sense to have them come from the same vendor. I think Saber is responding to a general trend."

LMS comprises Saber LAN Workstation, Saber LAN Workstation for Macintosh Computers, Saber Enterprise Application Manager and Saber Server Manager, as well as Saber's Software Developers Kit. With the kit, users can build applications using data provided by LMS, Saber said.

In addition to the file and software distribution, inventorying and remote control tools, LMS provides a centralized Windows-based console for real-time information viewing and management, and an event manager to track and prioritize predefined activities. The package is for DOS and Windows clients, with similar functionality available for Apple Computer, Inc.'s Macintosh clients on AppleTalk nets, the company said.

LMS also provides server management features, such as the ability to adjust communications settings, memory allocations, file and directory cache buffers, and transaction tracking. Other capabilities include application metering, LAN and WAN server-to-server software license borrowing, directory scanning, and software discovery for automatic inventory creation.

LMS client features

- Centralized file and software distribution
- Automatic software and hardware inventorying
- Scripting languages
- Remote control
- Centralized, Windows-based console for real-time information viewing and management
- Event manager

Network managers can install the various LMS components, packaged on a CD-ROM, through a single procedure.

Available now, LMS costs $299 for media and documentation. Saber offers the discounted rate of $44 per node for sites with at least 250 nodes.

HELP DESK LINK

Separately, Saber announced it will link its Saber LAN Workstation tool with the Support Express help desk software from Software Marketing Group, Inc. (SMG), of Des Moines, Iowa. The products will share a single database, which means Support Express users will get real-time access to Saber LAN Workstation's remote control, messaging, and automatic software and hardware inventory capabilities, Saber said.

"They're definitely ahead of the curve here," Cain said. "Clearly, the help desk function can no longer work in isolation from LAN management. Tying them together makes a lot of sense."

Access to the Saber LAN Workstation data will speed troubleshooting for help desk personnel, Saber said.

For example, the remote control features will let help desk personnel diagnose and resolve problems without going to the workstations involved. Instead, they will be able to click on a button and gain control of the workstation. After the help desk disconnects, the time and actions are logged into Support Express to create an audit trail.

SMG will use Saber's developers' kit to create the link between Support Express and Saber LAN Workstation. The product, called ExpressLink for Saber LAN Workstation, is scheduled to ship by March 31 for $595.

©Saber: (800) 338-8754.

Now You Can Take The Trouble Out Of Trouble Calls.

NEW

Data Comm MAGAZINE Hot Products

Read network signals through the cable without adapters.

Record and graph network utilization.

Display real-time network statistics.

The first non-intrusive instrument for testing active networks. Clip on to a cable, push a button and instantly you have critical network traffic information. With the connectionless *psiberNET*, disconnecting cables to run tests is no longer required and you won't be crawling under a desk to verify that the network interface card is working. Troubleshooting has never been faster and easier.

Powerful help that fits in your hand.

The *psiberNET* weighs less than eight ounces and can be carried in a shirt pocket making it an ideal tool for every trouble call. Monitor instantaneous, average and peak traffic or log network activity for up to 24 hours. The *psiberNET* works with UTP, STP and Coax cables on Ethernet and 4/16 Mbs Token Ring networks.

What's more, the *psiberNET* has audio and visual alerts to tell you when your selected network conditions have been exceeded.

People depend on you to respond quickly to network problems and you can depend on the *psiberNET* to guide you to the solution fast.

Go connectionless for less trouble with trouble calls.

Call **1-800-677-7724** for more information on the most advanced line of non-intrusive tools for network professionals.

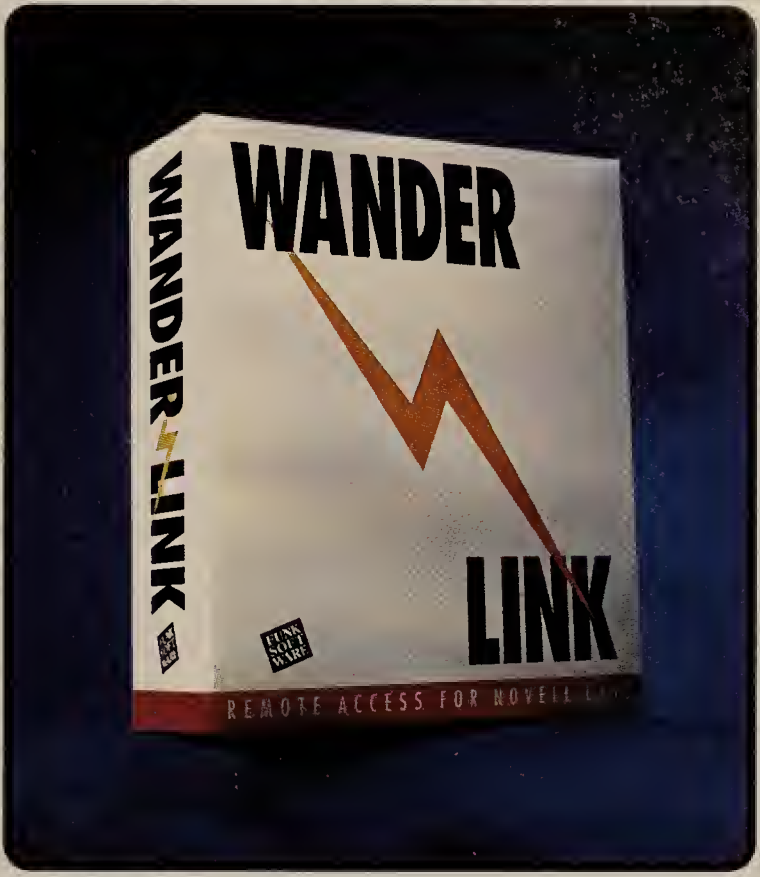
$595
List Price

psiber
DATA SYSTEMS INC.
Expert Tools for Network Professionals

Connectionless, *psiberNET* and the Psiber Logo are trademarks of Psiber Data Systems Inc.
4011 Camino Alegre, La Mesa, CA 91941 Tel (619) 670-7456 Fax (619) 670-5427

Circle Reader Service #2

Remote access for NetWare.
Real fast. Real secure. Real simple.



Sure, there are lots of remote access solutions for Novell networks out there. But if you do some homework, you'll find that new server-based, software-only WanderLink just raised the bar in terms of performance and security.

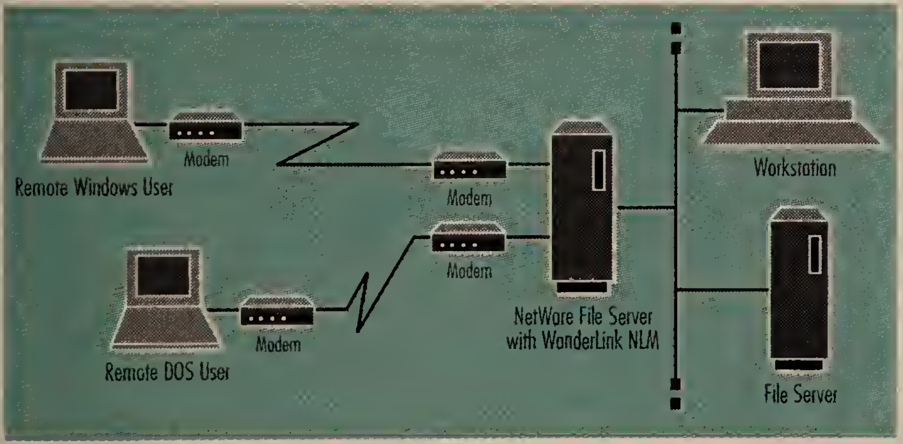
Network managers, you'll be impressed with WanderLink's easy installation, manageability, and airtight security. And anyone in your company that works at home, on the road, or out of a branch office will love the fact that WanderLink gives you both remote node and remote control at phenomenally fast access speeds.

NO HARDWARE INCLUDED

WanderLink runs as an NLM right on your NetWare file server, and can operate standard modems using the server's serial ports or a serial multiplexer card. All the hardware you need is off-the-shelf, and most of it you probably have already.

It's also amazingly easy to install. And you can administer WanderLink from any Windows PC on the network.

Turn any NetWare file server into a remote access server with WanderLink



REMOTE NODE *PLUS* REMOTE CONTROL

Before WanderLink, you had to choose between mutually exclusive options.

You could choose a remote node solution to let users directly connect to the LAN over phone lines — the perfect choice for tasks like reading email or editing documents. Or, you could opt for remote control to let users take over and operate a PC at work — the better choice for jobs that move large amounts of data over the network, such as database queries.

But, with WanderLink, you don't have to choose. You get remote node, plus powerful remote control for Windows that lets you operate any network PC at amazing speeds, right over your remote node connection.

BLAZING DATA

WanderLink compresses the data it sends over the phone line, so you can work at top speed. And, since compression is done in software rather than in your modem, baud-rate bottlenecks are eliminated and throughput can increase dramatically. Plus, a special Virtual Device Driver (VxD) ensures that access from Windows is just as reliable as it is from DOS.

IRON CLAD SECURITY

One last thing you get from WanderLink and nowhere else — peace of mind. In fact, you'll probably sleep better knowing that WanderLink has enough built-in security to confound the CIA, and maybe even scare off a hacker or two. Nothing is more secure.

Only WanderLink gives you this much security

Password Protection lets you authenticate users with a secure challenge-response mechanism.

Restricted Dialback lets you force dialback to a pre-determined phone number for any user.

NodeID lets you control access by fingerprinting the PCs that users may dial in from.

Domain Filtering lets you limit the networks and nodes visible to any user to create packet-level firewalls.

Data Encryption lets you guarantee the privacy of your communications with Diffie-Hellman key agreement and RC4™ Encryption from RSA Data Security, Inc.

For more information call:
1-800-828-4146
Ext. 942

© Copyright 1994 Funk Software, Inc. All rights reserved. WanderLink and NodeID are trademarks of Funk Software, Inc. WanderLink is licensed based on number of dial-in ports on the server. The WanderLink Client can be distributed freely. For each licensed dial-in port, one WanderLink Remote User Pack containing one Remote Control Master and Host license is also included. Additional Remote User Packs are available separately.

Funk Software, Inc., 222 Third Street, Cambridge, MA 02142 • Tel. (617) 497-6339 • Fax (617) 547-1031

Circle Reader Service #1

Micro Focus wares to ease client/server move

BY JOANNE CUMMINGS

Palo Alto, Calif.

Micro Focus has unveiled a 32-bit version of its object-oriented COBOL compiler and a development environment for the programming language that includes an ANSI standard relational database.

The two products are aimed at letting users more easily migrate critical mainframe COBOL applications to client/server environments, Micro Focus said.

"The announcements are very strong," said Kevin Schick, research director at Gartner Group, Inc. in Stamford, Conn. "It's an endorsement of the fact that users are finding they need to move off the mainframe to client/server but that they need the ability to easily transition this legacy environment."

The 32-bit compiler, called Object COBOL Version 3.3 for Windows NT and OS/2, supports COBOL and object-oriented COBOL programming. It follows on the heels of a 16-bit version the company introduced last May.

"The bottom line is, when you're doing object-oriented development, you tend to be in a very advanced environment requiring very high performance," Schick said. "That just does not equal 16 bit. This announcement shows that Micro Focus is serious."

In addition to the 32-bit engine, Version 3.3 supports the OLE2 Automation component of OLE technology from Microsoft Corp. in Redmond, Wash. This allows tight integration of Object COBOL applications with other OLE2 applications, such as the Excel, PowerPoint and Word programs from Microsoft.

Object COBOL also can be used as a scripting language to access methods in other OLE2 applications. Previously, users needed to use other languages to access those methods, Micro Focus said.

Version 3.3 will be available this quarter for $1,500.

OPEN DIALOG

The development environment, called Micro Focus Dialog System Version 2.5, comes equipped with an ANSI standard relational database from XDB Systems, Inc. in College Park, Md., and supports other databases via Microsoft's Open Database Connectivity technology.

"In application development, the bulk of time and cost isn't in the coding; it's in the testing, and this is a way to give people a higher level of confidence in testing," Schick said.

The software is available now for $1,250.

©Micro Focus: (415) 856-4161.

Focusing on COBOL

Object COBOL 3.3 features:

- A 32-bit engine
- Support for COBOL and object-oriented COBOL programming
- Support for Microsoft's OLE2 Automation technology
- Ability to function as scripting language

Cubix makes its servers more manageable

BY MARGARET DORNBUSCH

Carson City, Nev.

Cubix Corp. last week introduced management software for its communications and applications servers, as well as a new ISA- and EISA-based fault-tolerant enclosure for its servers.

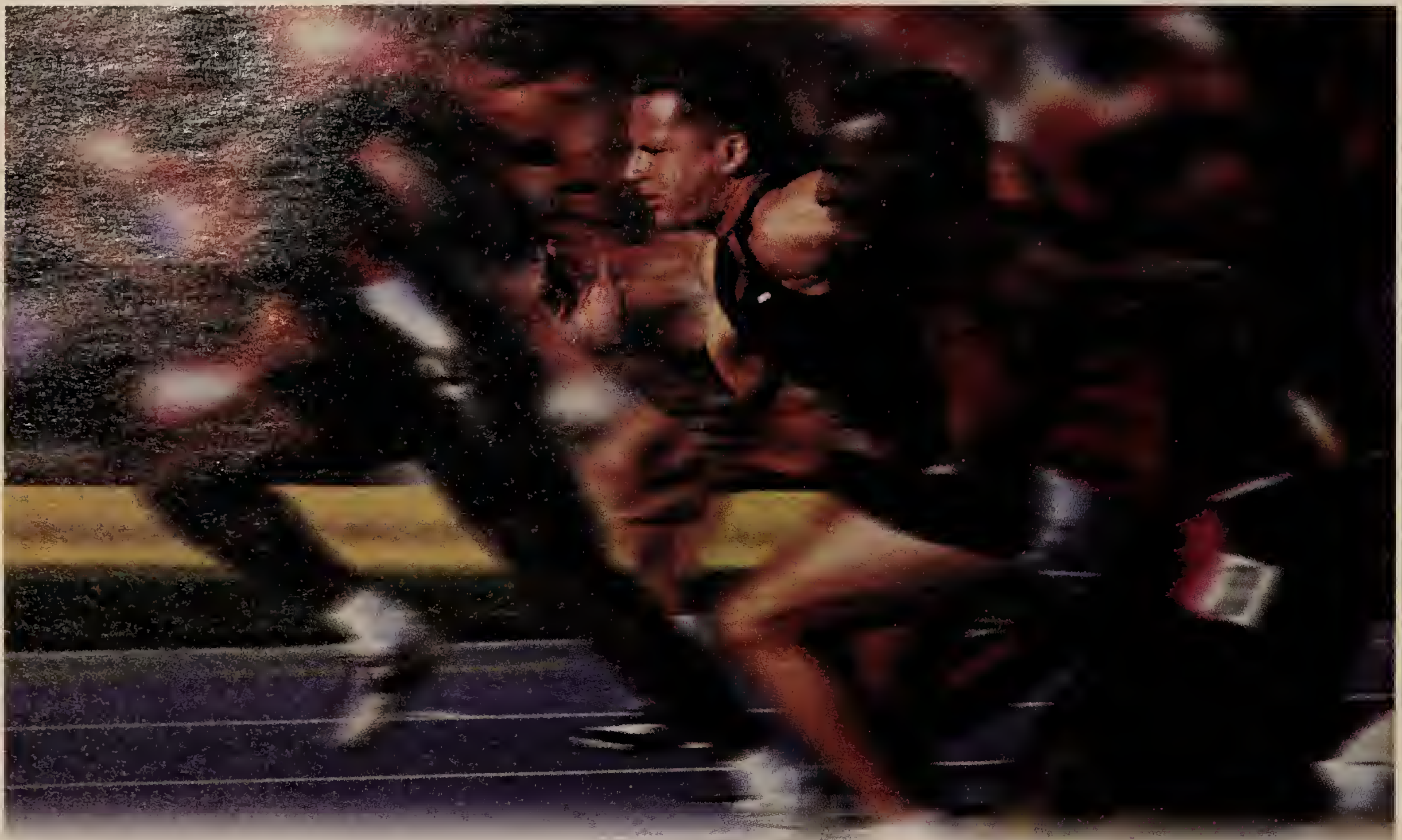
The Cubix Management System (CMS) is a Windows-based, Simple Network Management Protocol package for monitoring and controlling Cubix's communications servers across a network from a central site. The company offered SNMP support on its devices previously but has not sold an actual SNMP management program.

Cubix offers communications and applications servers that consist of personal computer cards designed to plug into a multicard enclosure. The cards support dial-up communications, fax, electronic mail and other applications.

In addition to CMS, Cubix rolled out a new enclosure dubbed the Fault Tolerant Enhanced Resource Subsystem II (ERS/FT II). It provides housing, redundant power supplies and cooling systems for as many as eight Cubix PC boards.

CMS can be used to manage the SNMP-compliant PC cards within an ERS/FT II via a proprietary supervisory CPU board, called the Intelligent Environmental Sensor (IES), housed in the enclosure. The IES provides CMS with information that is used to generate alarms for conditions within the enclosure,

See **Cubix**, *page L14*



WHEN
Okay, let's get real. Second best just doesn't cut it. So here's a group of printers that can put you in first place—the QMS® 3225, 3825 and 4525 Print Systems.
BETTER
They have incredible stamina, an extraordinary amount of network savvy, and can crank out documents like nobody's business.
ISN'T GOOD
When they're counting on you to get the job done, why not use a network printer that performs the way you do.
ENOUGH.
Show them all just how good you *really* are and give us a call today at ***800 392-7541*** Dept. ***5031***.
QMS®
Outperform The Very Best.
For service on QMS or other products, call 800 762-8894 (U.S.) • Q-Fax 800 633-7213 • Canada 800 263-5508
QMS and the QMS logo are trademarks or registered trademarks of QMS, Inc. One Magnum Pass, Mobile, AL 36618, 334 633-4300.
Circle Reader Service #15

MULTIPROTOCOL ROUTERS

New OpenGate features place RND in the competitive arena

BY JOANNE CUMMINGS

Costa Mesa, Calif.

Rad Network Devices, Inc. (RND) has unveiled software and hardware enhancements that bring frame relay, dial-up connectivity, security and Ethernet features to its line of OpenGate multiprotocol routers.

The features make RND a stronger player in the multiprotocol router arena, analysts said.

"With this new release, RND has become truly commercialgrade and better able to compete with companies like Cisco," said Glenn Gabriel Ben-Yosef, president of Clear Thinking Research, a market research and consulting firm based in Boston. "Before this, it was missing key features and was more of an also-ran."

Ben-Yosef said the addition of frame relay software for the OpenGate routers is particularly important. "Frame relay is the mode of choice now for connecting remote branch offices. RND really needed to add that," he said.

TRIGGER-HAPPY

In addition to frame relay, the software includes a feature that lets OpenGate users establish and terminate dial-up connections. The feature, called Connection on Demand (COD), lets users place dial-up ISDN, frame relay or X.25 calls via three triggers, according to RND.

A manual trigger enables users to establish or disconnect the link at any time. A time trigger lets them define as many as three periods per day for connection and disconnection.

The on-traffic trigger raises the link automatically when a frame matches a user-defined condition.

Previously, the routers only supported dial backup functions, the company said.

> **"Frame relay is the mode of choice now for connecting remote branch offices. RND really needed to add that," said Glenn Gabriel Ben-Yosef, president of Clear Thinking Research in Boston.**

The software, called Version 4.0, also includes a security feature that blocks and forwards packets based on source and destination addresses and protocol.

The Facility for Access Control and Security (FACS) feature accomplishes this filtering in hardware, so it does not lead to performance degradation within the router, the firm said.

FACS also includes a graphical user interface that lets network managers assign filtering criteria on a user-by-user basis.

For example, they can employ the feature to prevent users who need access to an inventory program from tapping into a payroll application that resides on the same server.

FACS will block all attempts to access the payroll application and report the violation to a management station by identifying the source protocol and destination of the violation, according to RND.

COD and FACS are available for free to all current OpenGate users. Frame relay support costs $600.

HARDWARE

RND also upgraded its OpenGate line with three new Ethernet modules, including an eight-port 10Base-T hub.

"The new modules, especially the hub module, offer users a real enterprisewide solution," Ben-Yosef said.

"When you're looking to configure remote offices, it's nice to get the router and hub functions from the same vendor; it gives you some standardization," Ben-Yosef added.

The single-port ET 1/8 card fits within either the 12-slot OpenGate C12 or four-slot OpenGate C4 models.

Network managers can connect as many as eight workstations or servers to the card.

The other two modules — the four-port ET4 and the two-port ET2 — let users increase the capacity of the OpenGate routers by enabling them to support more segments.

Each card has an i960 Reduced Instruction Set Computing processor, which helps optimize performance, according to company officials.

The cards are available now. The ET 1/8 costs $2,295, the ET2 is priced at $3,250, and the ET4 is $5,950.

©RND: (714) 436-9700.

Comments?

See "How to reach us" on the back page.

NETWORK ACCESS HORSEPOWER:

Take charge of your T1 network. DataSMART outperforms them all.
In reliability. Diagnostics. And value.

DATASMART® T1/FT1 DSU/CSUs

Our SMARTOptions™ series of network management tools offers you proven solutions — from menu interfaces to SNMP GUIs.

WITH SMARTOPTIONS™ MANAGEMENT.

So request your free copy of our "SMARTOptions Portfolio" today by calling 800-ADC-KTRX or info@kentrox.com via the net.

ASCII/TELNET

SMARTools™

MultiSMART™ GUI

SMARTView™

UNIX SNMP

ADC Kentrox®

Making Technology Practical

ISO9001 CERTIFIED

5 YEAR WARRANTY

Circle Reader Service #6

Claris plans to add relational capabilities to FileMaker Pro

BY JOANNE CUMMINGS

Santa Clara, Calif.

Claris Corp. has announced plans to develop a version of its FileMaker Pro database software that will include relational capabilities.

The new version of FileMaker Pro, which is designed for small businesses and workgroups, will provide such key relational features as the ability to establish one-to-many and many-to-one joins between tables. It will continue to include a Look Up feature that lets users paste related data from one file to another.

Converting data and files from the current Version 2.1 to the new Version 3.0 will be accomplished with just one mouse click, according to Claris of Santa Clara, Calif.

"FileMaker Pro 3.0 will provide the key relational database capabilities that our customers are asking for, while maintaining its legendary ease of use," according to Daniel Eilers, president and chief executive officer at Claris.

The company declined to provide specific availability, saying only that the new version would ship some time in 1995.

In addition, Claris declined to provide any pricing information.

©Claris: (408) 727-8227.

GOTTA HAVE IT.

IT'S THAT SIMPLE.

You just can't get to T1 or FT1 without a reliable CSU/DSU. It's that simple.

With Access System 100, Verilink keeps it simple, too. Set it up. Plug it in. Follow the LCD display. You're ready to go. SNMP. Built-in diagnostics. V.35 or RS-449. Automatic dial-out.

Best of all, you're with Verilink — the company that pioneered Extended Superframe (ESF). The company built on service.

Go LAN-to-LAN or LAN-to-WAN today. Order AS100. It's as easy to choose as it is to use. Call 1.800.VERILINK.

VERILINK
Responsive by Design

Circle Reader Service #12

Ace/Client boasts dynamic security feature

BY JOANNE CUMMINGS

Cambridge, Mass.

Security Dynamics Technologies, Inc. has unveiled remote client-based security software for Novell, Inc.'s NetWare environments.

The software, called Ace/Client for NetWare, offers more security than the static passwords traditionally used with NetWare, the company said. Remote users must provide a dynamic two-part logon to gain access to the NetWare server and LAN.

Ace/Client for NetWare consists of client NetWare Loadable Module (NLM)-based software and a smart card, called the SecurID card. It also requires Ace/Server software running on the server, according to Security Dynamics.

The Ace/Client for NetWare NLM asks remote users to submit a randomly generated code provided by the SecurID card, along with their secret personal ID number. That information is then transmitted from the client NLM to the firm's Ace/Server for authentication.

In addition to providing increased security, the software maintains a comprehensive audit trail of all access attempts, whether successful or unsuccessful.

Available now for NetWare 3.11 and 3.12 environments, Ace/Client for NetWare costs $149 per NetWare server. The SecurID cards cost $34 each.

©Security Dynamics: (617) 547-7820.

Cubix

Continued from page L12

such as out-of-range temperatures or voltages, failed fans or power supplies, or locked processors.

To minimize extraneous traffic on the network, the IES gathers SNMP data from PC cards housed in the enclosure and passes on only traps and alarms to CMS, said John Lillywhite, Cubix's marketing communications manager.

CMS can feed information to other SNMP management systems, such as Hewlett-Packard Co.'s HP OpenView and Novell, Inc.'s NetWare Management System. According to Lillywhite, Cubix plans by June to integrate CMS with IBM's NetView.

A 19-inch rack-mountable or desktop enclosure can hold as many as eight 100-MHz 486DX/4 or four 60-MHz Pentium Cubix CPU cards. Each CPU board can host a different service, such as dial-up communications or E-mail. The ERS/FT II system's two 375-watt load-sharing, hot-swappable power supplies and redundant system cooling fans provide enhanced fault tolerance. The ERS/FT II's drive bay can hold up to eight 3.5-inch hard disk drives.

The Cubix Management System costs $595, while the ERS/FT II is priced at $4,195. Cubix CPU boards range in price from $1,000 to $5,000, depending on the memory configuration, processor and speed. All products are available now.

©Cubix: (702) 883-7611.

Remote control software works with TCP/IP, Windows Sockets

BY JOANNE CUMMINGS

Holliston, Mass.

Avalan Technology, Inc. has introduced software that lets remote or traveling users take control of their LAN-attached, Windows-based personal computers to access corporate applications.

The software, called Remotely Possible/Sockets, works with any vendor's TCP/IP stack, provided it has a standard Windows Sockets interface.

This obviates the need to run dual stacks and makes it possible to work with more than one vendor's implementation, according to Avalan.

Since it is based on Windows' Dynamic Link Libraries, the software does not require any DOS memory or terminate-and-stay resident (TSR) programs. It takes up less than 200K bytes of Windows memory, said Avalan, based here.

Remotely Possible/Sockets comprises a host portion that runs on the LAN-attached PC and a viewer segment that runs on a user's home PC or laptop. Both PCs must be configured with Microsoft Corp.'s Windows 3.X or Windows for Workgroups.

Remote workers can take control of a PC via any TCP/IP network by using a dial-up Serial Line Internet Protocol (SLIP), IP or Point-to-Point Protocol connection.

Once connected, they can transfer files and cut and paste text from one PC to the other, as well as initiate printing.

The software works over routers, bridges and terminal servers, and supports all existing Windows drivers.

In addition, Remotely Possible/Sockets offers a variety of security features, including multilevel passwords, callback to a predefined address, optional logons and modem callback to a predefined number. Keyboards, mouses and screens also can be disabled.

The software is available now. It costs from $298 for one host and one viewer to less than $20 each in quantities of 1,000.

✆Avalan: (800) 441-2281.

LAN tools

Continued from page L1

until they come and take action.

Enter Server Sentry, which Circuit Masters distributes on a single, licensed disk.

At the product's core is an NLM that intercepts the error condition, attempts to write the processor registers to disk and then automatically reboots the server. Before rebooting, modem-equipped servers can run a DOS program that sends a message to an alpha or numeric pager.

GOOD, BUT NOT GREAT

It's quite simple to get Server Sentry to run, but Circuit Masters has left considerable room for improvement.

The software is installed on the file server while running NetWare. Network managers must key in information such as the organization's name, the name of the company that holds the license, and a license key .

Circuit Masters offers 30-day free trials for which network managers are given a null license number.

At the end of the trial period, the installation stops working. If network managers opt to install a licensed copy, they enter the license key number provided. After the net managers enter the correct number, the software copies seven files to the server, and the basic installation is complete.

If network managers want to use the paging system so they or one of their minions can be notified of a crash, they have to jump through a few hoops.

First, a network manager needs to run the ssentry.exe administration program under DOS to create the configuration file for the pager system and modem. The program is one of the seven loaded during basic installation.

Unfortunately, the modem setup and pager configuration are not logically organized or as sophisticated as they could be. But the ability to define which pagers should be notified at what times is well thought out.

Next, network managers must modify the system's start-up batch files in order to invoke the pager utility in the DOS partition autoexec.bat file and modify autoexec.ncf to automatically load the Server Sentry NLM. Circuit Masters suggests using Novell's Edit NLM. A better choice is the NetWare install program's start-up files editing option.

Circuit Masters really should have made the pager system and modem setup part of the server installation phase, since the configuration file and the pager utility need to be copied from the NetWare file system to the server's

See **LAN tools**, *page L16*

Introducing FastLink™.
The Cooperative Standard for Running Client/Server Applications Remotely.

The Leading Remote Access Vendors Working Together to Improve WAN Throughput.

We've got great news if you're thinking of adding dial-up links to your client/server network. Some of the biggest names in client/server applications have joined forces to take compatibility to a new level with the FastLink™ Partners Program. How will the combined efforts of FastLink help you? By saving up to 30% of your typical connect charges! And with BIG productivity and reliability gains. Rockwell's unique SmartRoute™ software, combined with the leading client/server applications, optimizes your Local Outer Network investment.

Here's the Fastest and Most Efficient Way to Access Information on WANs...

THE FASTLINK™ INTERNET FORUM

At your Web browser command line enter http://fastlink.rns.rockwell.com and you'll find everything to run a successful LON, from network tips to ordering products.

We're also adding a valuable new resource that will help you plan and administer your network. The "FastLink Forum" on the Internet, will bring you networking news, product information, demos and upgrades to keep you better informed than ever before. Look for FastLink compatible products. Together, we'll make your life a lot easier! Call **1-800-262-8023,** or to receive faxed information call **1-800-RNS-FAX2** today.

Rockwell Telecommunications

Circle Reader Service #10

LAN tools

Continued from page L15

DOS partition. But it's not a totally wasted exercise since network managers also can use this as an opportunity to configure the financial aspects of downtime.

Using the ssentry.exe, network managers will find setting up financial details a straightforward process. They can define as many accounting categories as they like and define what times constitute peak and nonpeak business hours.

CRASH TEST

Server Sentry works just fine. During a test of the software using an NLM for crashing the server and another intentionally faulty NLM, the abends generated were trapped and managed without problems.

When abends occur, Server Sentry traps the processor register data and the contents of all server console screens. As long as DOS has not been removed from the NetWare server, this data is saved in a file on the server's DOS partition. Whether or not the data is saved, it can then optionally be rebooted.

If the pager service is set up, the program starts up before running the server.exe program to start NetWare. Net managers can determine when Server Sentry sends a page based on the number of failures in a given time period.

As soon as the Server Sentry NLM loads, it checks the abend history file's date and time stamp on the DOS partition and copies it to the NetWare volume if a new abend has occurred.

Network managers can interrogate the history file from any DOS workstation using the ssentry.exe program. The reporting functions allow network managers to generate abend logs and analyses of the financial consequences of the downtime.

Overall, Server Sentry is a neat and simple idea, not to mention a very good value. It reliably does what it is supposed to do.

But it would be nice if Circuit Masters fixed the clumsiness of the configuration process, particularly regarding the pager and modem setup; sorted out the odd user interface of the DOS-based management utility; created a Windows version of that utility; made it possible to dump the entire memory image to disk rather than just the register contents; and provided better reporting services.

Nonetheless, network managers responsible for NetWare file servers shouldn't do without Server Sentry. It is simply fundamental for handling abends in a timely, effective way.

A PROGRAM WITH A VIEW

In a network environment, a huge number of files abound in a bewildering range of formats. This often leads to real headaches, since the ability to view file contents and translate data from one format to another normally requires a large number of applications and ridiculous operational gymnastics.

Keyword Office Technologies, Ltd.'s latest software, KeyView Version 4.1, is one of the slickest tools for dealing with this problem on Microsoft Corp.'s Windows 3.1. It can handle a remarkable number of formats, including word processors, graphics, fax documents and spreadsheets, for viewing and translation. What's more, KeyView operates with impressive speed.

Among the tool's features are automatic inclusion in Windows File Manager, support for drag and drop between File Manager and KeyView windows or its minimized icon, use as the default file viewer for Microsoft's MS Mail and Lotus Development Corp.'s cc:Mail, and the ability to launch applications from the viewer to handle an open file.

Users can convert formats simply by using the Save As option when viewing the file.

KeyView is unusual in having a scant amount of paper documentation. A six-page, foldout glossy crib sheet gives brief but concise installation and operation instructions. This is a refreshing change from the fat, bloated manuals that come with most products.

Keyword Office Technologies, of Calgary, Canada, also offers the full manual on-line as a Windows help file.

KeyView works exactly as specified and does so without fuss or irrelevancy.

HOT BOOKS

Unless you've had your head under a rock for a long time, you'll have heard of Pretty Good Privacy (PGP), a remarkable freeware program that offers very strong encryption. This powerful stuff can be used to protect files or ensure that unauthorized parties cannot read electronic mail messages.

Users who have had trouble fully understanding PGP software will want to get their hands on the recently published book, *PGP: Pretty Good Privacy*. The book succinctly and thoroughly explains all PGP users need to know about the software.

It covers a huge amount of information, including the history of PGP. It discusses encryption technologies and describes PGP software in detail. The book is definitely a must for everyone concerned about on-line privacy.

➺ Gibbs is a consultant and writer based in Ventura, Calif. He can be reached by phone at (800) 622-1108, Ext. 504, or on the Internet at mgibbs@gibbs.com.

ENTERPRISE DATA MANAGEMENT

Centralize and Manage Your Data Storage with Ultra High Performance LANser™ MRX™ RAID Systems from Sanyo Icon

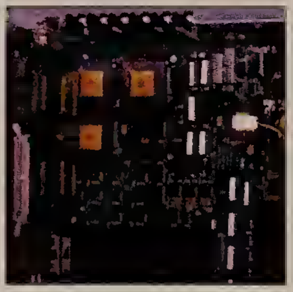
For supplying enterprise-wide LAN storage requirements nothing can surpass Sanyo Icon's LANser MRX (Multiple Raid eXtended) family of data management systems. Not all networks are alike. Many run multiple operating system platforms and LANser MRX systems can support simultaneously multiple platforms, hosts and servers.

Because not all data are alike, LANser MRX allows you to configure multiple RAID levels to match the desired levels of data fault tolerance – from mission critical to the not so mission critical.

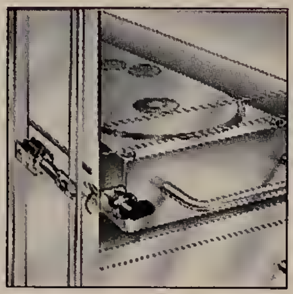
Every LANser MRX provides superior data management utilities, RISC powered intelligent data caching, fast SCSI 2 connections and they are available in models with capacities varying from 10GB to 3.2TB (terabytes). We believe in providing a total, enterprise-wide solution to your data storage requirements.

LANser MRX systems are installed at hundreds of Fortune 1000 locations with high performance workstation platforms where speed and performance as well as extreme reliability are demanded. To find out more about Sanyo Icon's enterprise data management, call us today.

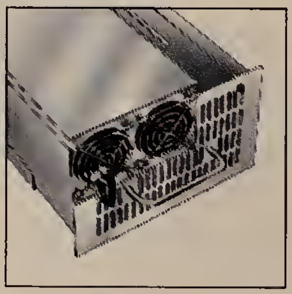
MRX electronics feature high performance 88100 RISC processor and up to 512MB cache and Sanyo Icon's performance rich operating system designed to manage disk activity.



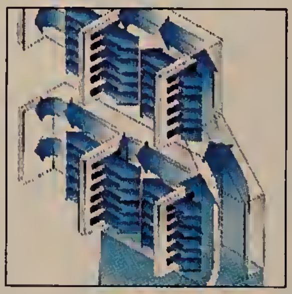
"Warm Plug" Disk Array Stacks are designed for on-site installation and maintenance. Electronically controlled solenoids are employed to prevent accidental removal.



MRX's 3 for 2 hot-swap Distributed Power Module Stack is designed for maximum reliability and redundancy. Made from exceptionally high MTBF components for maximum reliability.



Maintaining correct temperature is critical to prolonging the life of data and electronics. We employ variable speed air blowers, specially designed airflow plenums, temperature sensors and embedded controllers to adjust the air flow to meet temperature requirements.



SANYO ICON

Ultra High Performance Network Products

18301 VON KARMAN, SEVENTH FLOOR, IRVINE, CA 92715 TELEPHONE 714-263-3777 FAX 714-263-3758

Circle Reader Service #8

What good is your network monitoring and analysis equipment if it doesn't leave you completely covered?

© 1993 Hewlett-Packard Co. TMNTD369/NW

HP monitoring and analysis solutions: The more control you have, the less painful your job will be.

Your network is swarming with activity and it's more than your monitoring and analysis equipment can handle. Let's face it. That leaves you open to some potentially serious problems.

If only there were a way to gain control of the situation.

At HP, we've got you covered. From handheld testers and portable WAN/LAN protocol analyzers to distributed monitoring systems, we have a cost-effective solution for your network — no matter how big or busy it may be.

Take fault management. You'll find our monitoring and analysis products offer the capabilities to tame your most intimidating trouble spots. For example, expert systems and intelligent analysis allow you to maximize network availability by helping you isolate failures more quickly and easily than ever.

You'll also want to prevent network faults before they occur. That's when powerful baseline analysis can help because it shows you the warm spots before they get hot.

Finally, you've got to seriously consider future growth. And HP is there with an open systems, standards-based approach you'll never outgrow. Plus, historical tracking and trending information to help you plan for tomorrow.

Want proof about what HP is doing for network managers like you? Call **1-800-452-4844, Ext. 7978*** and we'll send you a free brochure on the industry's most comprehensive monitoring and analysis solutions.

Call today. And take the sting out of an out-of-control network for good.

*In Canada, call 1-800-387-3867, Dept. 481.

There is a better way.

HEWLETT®
PACKARD

NET RESULTS

by Mark Gibbs

Back from the future: Networking in the year 2000

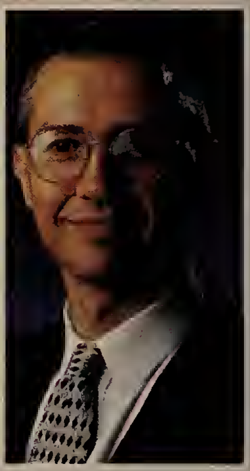
Work goes on 'round the clock here at the Gibbs Think Tank and Sushi Bar. Our latest research project is showing impressive results worth sharing with network managers everywhere.

Our goal is to discover the future, and our methodology is based on the simple concept of stochastically encoded information.

The idea is that white noise contains an infinite amount of information, meaning that it contains all frequencies simultaneously. So by filtering white noise correctly, you can extract any frequencies you please. As all frequencies are available, it follows that all mankind's knowledge and more is embedded in a white noise stream. We concluded that with the right kind of filter, we could look for useful information in white noise, which must logically include information about the future.

Our solution was to use a network of Gibbs' original Very Powerful Parallel Computers to sample a white noise source. By trying different digital filters in parallel, based on the characteristics of the human voice, we could look for speech. As soon as our system found something that looked like speech, we attempted to match it to words in a database of all known languages, then used a synthesizer to translate the information into audible English.

Our first run was a resounding success!



Of the infinite datastreams, we picked up what sounds like John Gallant, editor in chief of *Network World*, reading aloud from a future copy of the publication. Here is a transcript:

"Let's get this editorial meeting over so I can get back to my yacht and that new case of Dom Perignon. Ahem. Network World, *Monday, Feb. 14, 2000. Our lead story: Microsoft goes broke; Gates down to last trillion.*

"Washington, D.C. — President Gates announced in a press conference at the White House last week that the Supreme Court has upheld the right of the Fortune 1000 Software Association (F1SA) to buy software and maintain licenses in common. He plans to fire all of the justices tomorrow.

"The F1SA was formed in 1998 by the top U.S. companies to battle the spiraling prices of application software. Prices began to zoom upward when the Feds made it illegal to purchase foreign-made software able to encrypt data in such a way that the U.S. government could not decrypt it.

"Software prices had also been forced up as a result of a government requirement that all software also contain encryption technology developed by Microsoft Corp. This technology would only allow those knowing the exact value of President Gates' assets to decrypt the data.

We concluded that with the right kind of filter, we could look for useful information in white noise.

"The F1SA, in an attempt to reduce the cost of software to its members, adopted an application licensing system that uses the Internet as a communications mechanism.

This system allows all F1SA members to share software held in a common license pool across the U.S. The system has resulted in corporate software sales falling to approximately 10% of their mid-1999 levels.

"President Gates announced that Microsoft and the U.S. itself have now been forced to file for Chapter 11 bankruptcy protection. Gates is considering selling Microsoft's money-losing mainframe division (formerly called IBM) to Uzbekistan as part of an overall restructuring.

"Hmmm, damn good story. What's next? 'Bug in U.S. E-mail Service's Internet router causes one billion pieces of mail to be sent to King of England.' I like it..." buzzzzttt.

At that point, we lost the datastream. But we'll keep working on it. More from the future later when we find it before it has happened.

➺ Gibbs is a consultant and writer in Ventura, Calif. He can be reached at (800) 622-1108, Ext. 504, or on the Internet at mgibbs@gibbs.com.

FaxNET - the one hour free information resource from *Network World.*

Do you need more product information?
Do you need updated specifications?
Do you need it NOW?
Then call Network World's FaxNET today.

By calling toll free 1-800-664-8271 you can receive within one hour in-depth product information on the following companies.

ACD Kentrox	**36080**
Alantec	**36010**
Axis	**36000**
Psiber Inc.	**36140**
Sanyo	**36100**

Here's how it works

- Dial 1-800-664-8271 on your touch tone phone.
- You will be asked to key in the 5 digit number of the advertiser that interests you.
- Follow the voice menu instructions and you will receive the requested information within one hour.

There is no cost to you and you get the information when you want it.

1-800-664-8271

TO THE WORKGROUP, SWITCHED ETHERNET MEANS INCREASED BANDWIDTH.
BUT WHAT DOES IT MEAN TO THE ENTERPRISE NETWORK?

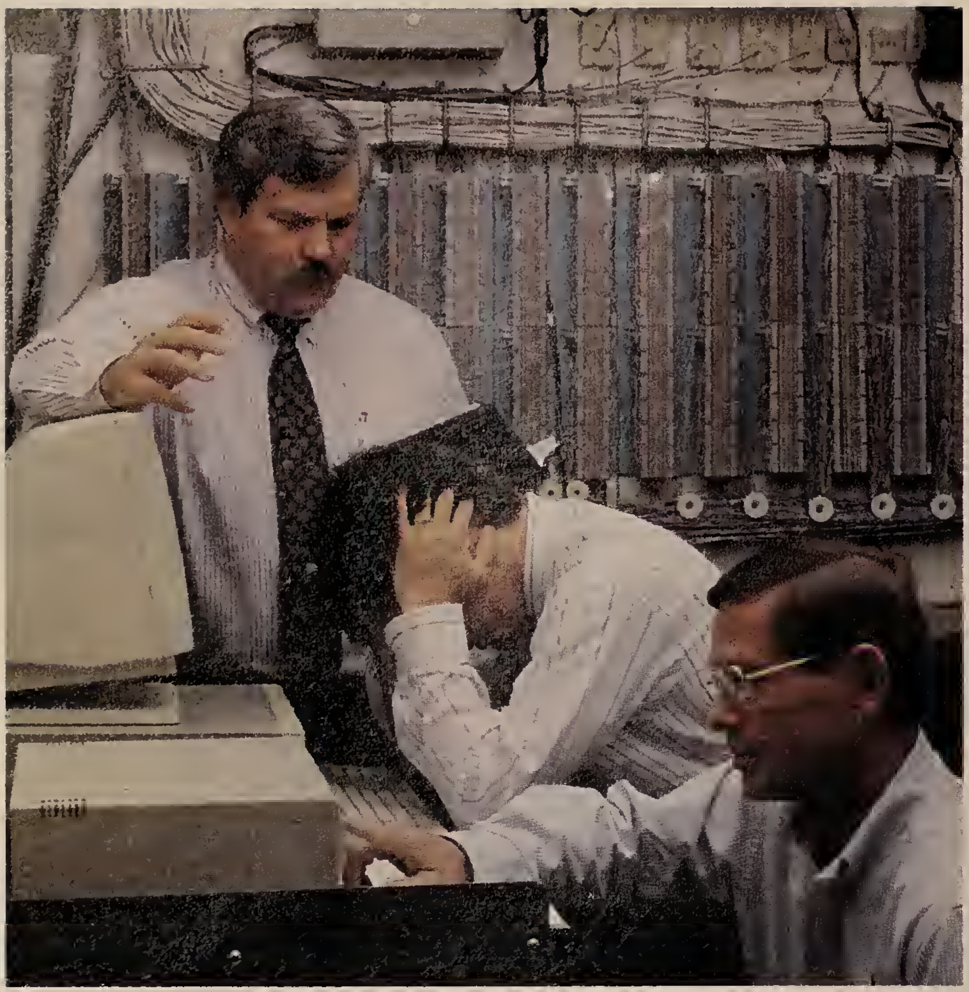
Fortunately, it's good news. Specifically, 10Mbps bandwidth for every workgroup user, and an ATM backbone across the enterprise. All thanks to the Hughes LAN Systems' Ethernet Switch with ATM, now available and ready to install in our Enterprise Hub.™ It's not just a short term workgroup solution, it's an enterprise-wide ATM solution. For information on the Ethernet Switch that fits nicely into your enterprise, call 1-800-395-LANS.

HUGHES
LAN SYSTEMS

© 1995 Hughes LAN Systems, Inc. Enterprise Hub is a trademark of Hughes LAN Systems, Inc. US (408) 565-8000, Germany (49) 6102-33037, England (44) 908 22 11 22. Or E-MAIL information@hls.com

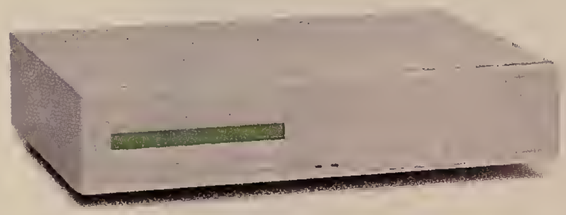
Circle Reader Service **#40**

Solution A
Typical Set-up time 2.5 hours



Solution B
Typical Set-up time 10 minutes

make the right choice



- *direct Ethernet or Token Ring connection to LAN/WAN*
- *embedded SNMP/TELNET agent*
- *complies with industry standard MIBs*
- *operates with any SNMP Network Management Software*

5 YEAR PRODUCT WARRANTY

TXPORT
TRANSPORT

TxPORT ... works for you

When it comes to installation, set-up, configuration, and control, other CSU/DSU vendors are left out in the cold. TxPORT has built it's T1 CSUs and CSU/DSUs on product designs that provide solutions and are simple to operate. We understand that most Network Managers do not have a lot of time to read operation manuals or budgets to hire independent consultant to install their communication equipment.

That's why every TxPORT product is shipped with a Quick Configurator Guide that permits installation in minutes. No complicated menu structures. No additional equipment. No technical consultants. Just simple, straight-forward instructions and operations.

Instead of hearing comments from our customers such as "I don't understand?" or "Could you go through that one more time?" we hear "That was so simple!", "How did you do that?" and "Why doesn't everyone operate this way?".

Backed by Evidence!

PRODUCT
SNMP-MANAGED DEVICES
TESTING

Our embedded SNMP/TELNET agent is a perfect example of superior product design and implementation." The results were eye-opening." "There were no changes or reconfiguration required at the management station, and the management link was established in minutes." "The SNMP management of this T1 CSU/DSU is highly effective. In fact, this WAN device was clearly designed with SNMP in mind as its primary management protocol". Communications Week Product Comparison - December 13, 1993

---

205 772-3770 / 800 926-0085
E-MAIL: info@TxPORT.com
FAX 205 772-3388

"Universal Access To Core Telecom Services"

©TxPORT 1995

Circle Reader Service #36

There's a company that cares as much about
where you are
as where you're going.

where you are

is *sick* of *hearing* the word

“*access*”

without *knowing what*

Simply put, AT&T Paradyne is about one thing and one thing only. Giving you access to the network. The public network, the private network, any network. Even the network of the future. From where you are right now. Modems with speed and functionality. CSU/DSUs that won't let you down. Technologies that'll let you do the things you've dreamed about. Products and technologies which give you access to anybody on earth, any place, any time. No one but AT&T Paradyne gives you more ways, or more cost-efficient ways to Access the Globe.

means.

Access the Globe.

with the AT&T Paradyne family of modems.

We invented the modem in 1957. And we've reinvented it ever since. Developing modems with incredible capabilities. The fastest one in the world. Ones that'll work wherever in the world you are. Each one rigorously tested. Proven reliable. Supported by AT&T. And competitively priced. So whether you're dialing up the Internet, working at home, managing a big network or vacationing on the beach, we can fix you up with a modem that'll put you in touch with the rest of the world.

COMSPHERE® 3800/3800*Plus* Modems - *Software defined, network managed, stand-alone, carrier mounted or nest card, diagnostic control panel, V.32/14.4 Kbps and V.34/33.6 Kbps, 2/4-wire, 2-year warranty, from $650.00*

COMSPHERE 3900 Modems - *Software defined, network managed, suited for dedicated analog networks, V.32bis/14.4 Kbps and 19.2 Kbps, multipoint and point-to-point, integral dial restoral, 2-year warranty, from $1995.00*

DataPort® Modem - *Stand-alone data/fax, 14.4 Kbps, Enhanced Throughput Cellular (ETC™), optical line interface, lifetime warranty, PC or Mac version, from $305.00*

DataPort Express Modem - *External or internal data/fax, 14.4 or 28.8 Kbps, 16550 UART, 5-year warranty, PC or Mac version, from $129.00*

DataPort 2001 Modem - *Data/fax, supports simultaneous voice and data on single analog phone line, compatible with collaborative shared application software, 14.4 Kbps, 5-year warranty, from $355.00*

KeepInTouch™ Cellular Modem - *PCMCIA data/fax, 14.4 Kbps with direct connect to 40+ different cellular phones or 28.8 Kbps with connect to 15 phones, ETC error-correcting algorithm, 5-year warranty, from $349.00*

KeepInTouch Express Modem - *PCMCIA data/fax, 14.4 or 28.8 Kbps, 5-year warranty, from $239.00*

Prices shown are recommended list price. Prices may vary.

where you are
is wondering,
if
AT&T Paradyne
has suc
prices
on modems,
CSU/DSUs
and such,
wh
advertise
them
?

Our products do have good prices. And starting now, we're going to mention them every chance we get, to show you what a good deal they are. But we also never want to forget to mention what good values they are. Our CSU/DSUs, for example. We continue to win award after award after award. But we manage to price them competitively without sacrificing their technical integrity, their reliability and the product support you could only get from a company with a name such as ours. What does this really mean to you? It means we understand that business requirements go hand-in-hand with budget requirements. It means that with AT&T Paradyne, you can access the four corners of the globe without reaching too far into your pockets.

Access the Globe.

with the AT&T Paradyne family of CSU/DSUs.

AT&T Paradyne CSU/DSUs lead the industry in customer satisfaction. This is the conclusion of a 1994 IDC poll of 200 telecommunications managers nationwide. We think the reason for this is simple. We have great products – from 56K DSUs to multiple T1/E1 access multiplexers for lease-line, frame relay and ISDN environments. Not to mention great prices. With our products, you can hook up to any private, public or hybrid network and gain access to any place on earth. And do it with confidence.

ACCULINK® 3160 Series - *Stand-alone CSU/DSU, 2/4 ports, EIA-530, RS-449 or V.35 data for access to T1, Fractional T1 or frame relay, includes DSX-1 drop and insert port, embedded SNMP agent, 2-year warranty, from $2795.00*

COMSPHERE® 3615 Series - *Diagnostic router/frame relay DSU, with dual-flow function for single-call site management or bandwidth on demand, available in stand-alone or card versions with 2 SW56 or 4 SW56 analog 14.4 Kbps dial module options, 2-year warranty, from $1795.00*

COMSPHERE 3610 Series - *Single port, multiple line-speed DSU, user-selectable V.35 or RS232 DTE connectors, optional 2 or 6-port multiplexer, analog backup or switched 56 Kbps dial backup in 2/4-wire versions, available as carrier card or stand-alone unit, 2-year warranty, from $1295.00*

COMSPHERE 3550 Series - *Multirate DSU, full remote network management capabilities, available in stand-alone or card versions and optional analog dial restoral, 2-year warranty, from $895.00*

COMSPHERE 3510 Series - *Multirate DSU for applications not requiring centralized network management, available in stand-alone or card versions, 2-year warranty, from $695.00*

ACCULINK ACCESS CONTROLLER - *Integrated access multiplexer, consolidates access to multiple network services into a single platform, T1/E1, 2-year warranty, from $5900.00*

Reseller News Editors' Choice

COMPUTERWORLD

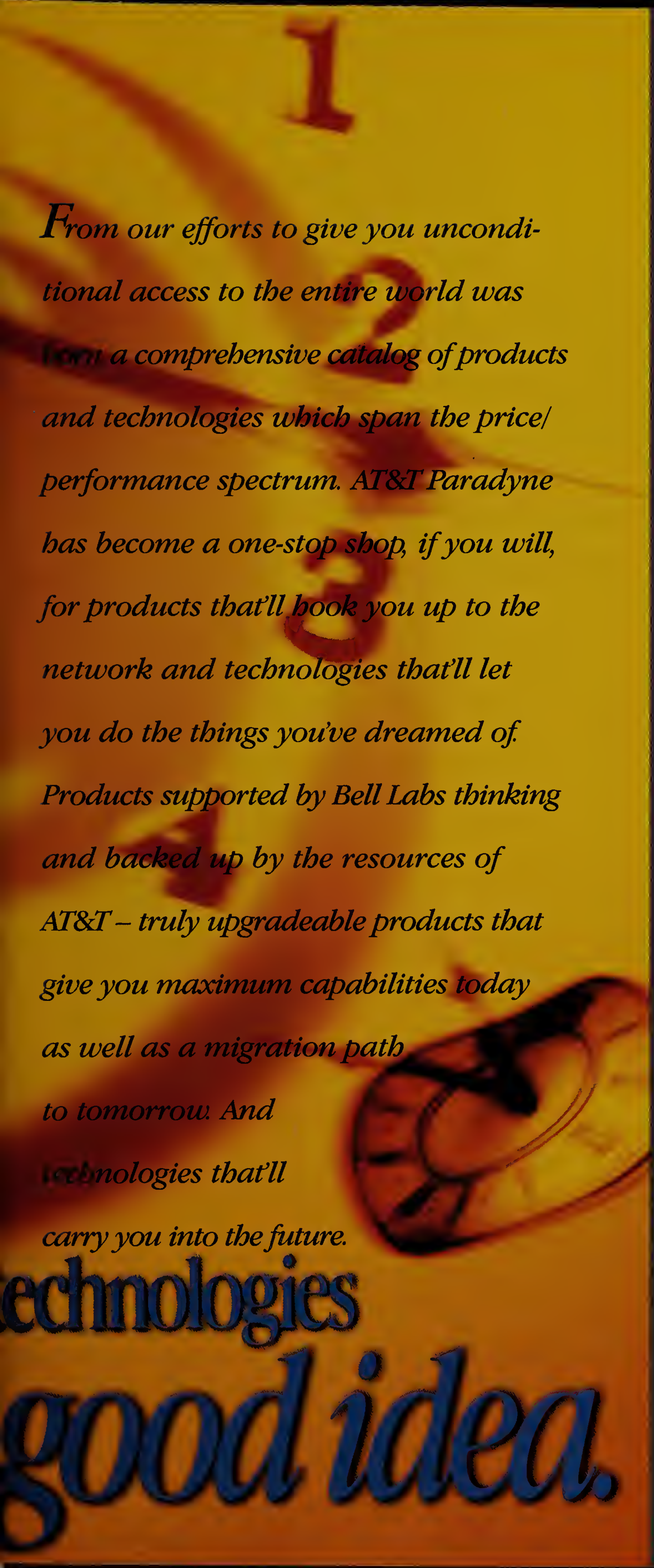
COMPUTERWORLD

COMPUTERWORLD

AT&T Paradyne

Prices shown are recommended list price. Prices may vary.

where you are
is waiting patiently
for it to dawn
on somebody
that
one-stop
shopping
for
modems,
CSU/DSU
and
acces
might be



From our efforts to give you unconditional access to the entire world was from a comprehensive catalog of products and technologies which span the price/performance spectrum. AT&T Paradyne has become a one-stop shop, if you will, for products that'll hook you up to the network and technologies that'll let you do the things you've dreamed of. Products supported by Bell Labs thinking and backed up by the resources of AT&T – truly upgradeable products that give you maximum capabilities today as well as a migration path to tomorrow. And technologies that'll carry you into the future.

Access the Globe.

with the AT&T Paradyne family of technologies.

The technologies we're pioneering are revolutionizing communication. And ultimately making the things you've dreamed of possible. Video on demand in the home. Interactive customer support. On-line data services. Remote training. Gaming. Telecomputing. Collaborative computing. The works. We're pushing the limits of our industry so you can push the limits of yours.

AT&T VideoSpan™ Technology - *The industry's leading ADSL technology for video on demand over existing twisted-pair copper telephone lines. VideoSpan has been selected as the ADSL technology of choice in 11 worldwide trial lines. This represents over 28,000 lines. All competing ADSL technologies combined represent less than 1% of all awarded trial lines.*

AT&T VoiceSpan™ Technology - *The industry's leading simultaneous voice and data technology for dial-up personal conferencing. VoiceSpan revolutionizes modems, fax machines, video games and computing platforms. It's enabling new and exciting forms of collaborative office equipment to let users share color graphics and faxes while talking. VoiceSpan will also spawn new on-line service and multiparty audiographics.*

Enhanced Throughput Cellular (ETC™) - *AT&T Paradyne's answer to cellular data protocol is the industry leader. It supports the highest throughput, highest reliability and fastest connection for short files of any technology on the market. All this means that wherever you are, on the top of a mountain or in the field on a sales call, you can now transmit data on a cellular phone and be assured that your data will arrive intact.*

Call 800 482-3333,
extension 741, for the 1995 AT&T Paradyne Interactive Product Catalog and sweepstakes information. No purchase necessary. See back for details.

AT&T Paradyne

©1995 AT&T. ACCULINK, COMSPHERE and DataPort are registered trademarks of AT&T. ETC, KeepInTouch, VideoSpan and VoiceSpan are trademarks of AT&T. All other products or services mentioned are trademarks or service marks, registered trademarks or registered service marks of their respective owners.

Access the Globe.

Win A Trip Anywhere in the World!

Win a trip anywhere in the world!

We have the best and most affordable network access products in the business, and now you can see them in one place - the 1995 AT&T Paradyne Interactive Product Catalog. Get your interactive product catalog today. Look at it right away. You may have already won the trip of your dreams anywhere in the world. It's all part of AT&T Paradyne's "Access the Globe" Sweepstakes. For those of you who don't fool with sweepstakes, because you consider your chance of winning slim-to-none, consider this: We're awarding not just one, but three grand prize trips. Plus, ten 1st prizes – Access the Globe kits (laptops with a PCMCIA modem and a cellular phone); one hundred 2nd prizes – superbig, supersoft beach towels; and three hundred 3rd prizes – baseball caps with our very colorful Access the Globe logo. So in truth your chance of winning something is pretty good. But even if you don't win anything, we promise you'll have a great time playing the sweepstakes. And you'll find out about the leading access products in the world.*

Call 800 482-3333

*extension 741, today. Get your 1995 AT&T Paradyne Interactive Product Catalog,** play the exciting game "Access the Globe" and find out if you're a winner.*

AT&T Paradyne

**Total value up to $10,000. **Interactive catalog and game available until 5/31/95 or while supplies last. No purchase necessary. Void where prohibited. Open only to U.S. residents who, as of 2/12/95, are 21 years of age or older and are owners/users of personal computers, with the exception of AT&T employees and their families. Complete rules, by which all entrants are bound, contained on response disk. Limit one response disk per person. Sweepstakes ends and all prizes must be claimed by 7/31/95.*

GLOBAL SERVICES

Voice and Data Services, Mobile Computing, Regulatory Issues and Voice CPE

'NET SECURITY

Users send out an SOS to Internet providers

BY JOANIE WEXLER

Companies feeling jittery about the security risks of doing business on the Internet can look to their access providers, in part, to reduce their on-line vulnerability.

PRIMER

The security options vary broadly among providers (see graphic, page 46). Some, such as Sprint Corp., offer next to none, being in the business of basically providing dial tone into the 'Net and leaving customers on their own to fend off attacks by hackers.

Others offer any combination of consulting, sophisticated access filters called firewalls, firewall configuration and maintenance, application-protecting proxy software and multiple levels of encryption.

WHAT ROLE?

Depending on their application, users may not need airtight security. But they at least want the security options to be there.

"Access companies should be required to offer encryption," said Dan McFarland, general manager of the department of electricity and telecommunications for the city of San Francisco, which is investigating the Internet as a means to generate new business opportunities.

"Encryption is really the only way to minimize your risk," he said. "I don't have that expertise on my staff."

Some users believe their providers should share liability for a breach, the way toll fraud losses are beginning to be shared by the carrier, phone switch maker and user in the voice world.

"I expect [the provider] to guarantee security if I'm to go forward," said Bill Dean, president of Master Communications Group, Inc., a video production house in Minneapolis that is considering Internet-based sales.

Cambridge, Mass.-based BBN Internet Services Co., which operates EARNet in New England and BARRNet on the West Coast, and is acquiring URANet in the South, will accept full sponsibility for Internet packets getting to the appropriate host on user sites, said John Curran, chief technical officer at BBN.

BBN will install, configure and monitor firewalls on the user site 24 hours a day.

If firewall filters become outdated, there are holes in the maintenance, Curran said. "This is not a trivial task for someone new to the Internet," he said.

Firewalls employ a complex set of software services to connect a secured, corporate network from an unsecured network, such as the Internet. They can be configured to control access, authenticate users, hide some or all of a corporate network to the public, and protect live corporate data by permitting access to only parts of applications.

At the ComNet '95 show last month in Washington, D.C., CompuServe, Inc.'s Network Services Division announced that two firewall options are available to its customers: Trusted Information Systems, Inc.'s application-level gateway, called Gauntlet; and CheckPoint Software Technologies, Ltd.'s services layer FireWall-1.

Application-layer gateways employ protection called "proxies" — slimmed-down versions of applications that are open to outside users and serve to protect the "real" application behind the firewall from bugs.

Services layer gateways inspect source and destination address pair and the type of services requested, then alert network managers if hacking is suspected.

CompuServe will install the CheckPoint or Gauntlet firewalls on the user

See **Internet SOS**, *page 46*

Questions to ask your Internet services provider

?
Where is the monitor that manages my leg of the Internet path? If the monitor sits in the backbone - rather than a dedicated line to your premises - your risk of being hacked is greater.

?
What flavor of Unix is your Internet gateway based on? Sun Solaris, for example, is well understood by hackers and easy to navigate. NextStep, on the other hand, uses offbeat FTP and telnet mechanisms and is harder to crack.

?
What procedures do you use to authenticate dealings with me as a customer? For example, can I call up and cancel my connection over the phone? How do you verify my identity?

Single-image management of call centers now on tap

Call-by-call routing featured in private ACD networks.

BY DAVID ROHDE

Dallas

Makers of automatic call distribution (ACD) hardware and software last week unveiled new ways for call center executives to manage multiple sites from a single location.

ACD vendors Aspect Telecommunications Corp. and Northern Telecom, Inc. demonstrated at the Call Center '95 show here how calls arriving at one location can be queued simultaneously at dispersed sites over leased lines or switched trunks. And GeoTel Communications Corp. announced that its call routing software can be used with an AT&T 800 service to feed data from multiple vendors' ACDs at distributed call centers to AT&T's intelligent network, easing call reporting tasks.

Call Center '95

At the show, San Jose, Calif.-based Aspect rolled out Network InterQueue, which employs ISDN Primary Rate Interface technology over dedicated circuits to signal as many as 52 dispersed Aspect CallCenter ACDs that a call is waiting.

Network InterQueue was introduced last year in the U.K., where British Airways plc uses it in three of its five call centers.

Before going live with the offering last August, British Airways already had a meshed leased-line network of European-standard E-1 circuits among four of its locations, with a single circuit from its Manchester, England, site to the fifth site in Belfast, Northern Ireland. But managers had to monitor the traffic to determine how to reroute calls, with no assurance that the next available qualified agent throughout the network actually would take the call.

Now Network InterQueue "takes the gut feel of the people out of it," said Dean Yardley, senior planning executive for British Airways in London.

For example, when a call comes into the call center in Newcastle, England, the Aspect ACD places it in a Newcastle agent group queue while activating the single D channel on a PRI. This places it in a similar agent group queue in the remote Manchester call center.

If a Manchester agent becomes available first, the network assigns one of the 30 B channels on an E-1 circuit to transfer the call, Yardley explained. Otherwise,

See **Call centers**, *page 40*

BRIEFS

McCaw Cellular Communications, Inc. has launched a developers program for its fledgling AirData **Cellular Digital Packet Data (CDPD)** service that includes on-line technical services through CompuServe, the Internet and the World-Wide Web.

The program follows a rash of other wireless developers programs over the past year, including the formation of the industry-wide CDPD Developers Forum, as well as various programs from ARDIS Co. and RAM Mobile Data for developers writing applications for their packet networks.

McCaw: (206) 803-4000.

Delphi Internet Services Corp. announced that it has expanded its **Internet access and on-line information services** to the U.K.

Through a new service dubbed Delphi Internet, Ltd., the company will provide local access and customized information services to personal computer users throughout the British Isles to which U.S. Delphi users have access.

Delphi: (617) 491-3342.

The first electronic version of *The Wall Street Journal* will go on-line next month over the **Dow Jones & Company, Inc.** service. Subscribers to *Personal Journal* can use a local telephone number — or companies can use an 800 number — to download a digest of the day's news or receive updates during the day.

Dow Jones: (800) 291-9382.

The **CDMA Development Group (CDG)** has created an international working group to address **Code Division Multiple Access (CDMA) interoperability** outside the U.S. CDMA is an emerging standard for circuit-switched digital cellular nets.

Through the working group, manufacturers, carriers and government entities can participate in CDG development efforts, such as features testing and conformance to specifications for higher speeds, according to the CDG.

The group said it has formed a Korean working group and is discussing membership with companies in Southeast Asia, South America, the Middle East, North America and Europe.

Hewlett-Packard Co. and **Bell Communications Research** plan to announce today that HP has licensed the Information Networking Architecture Distributed Processing Environment from Bellcore.

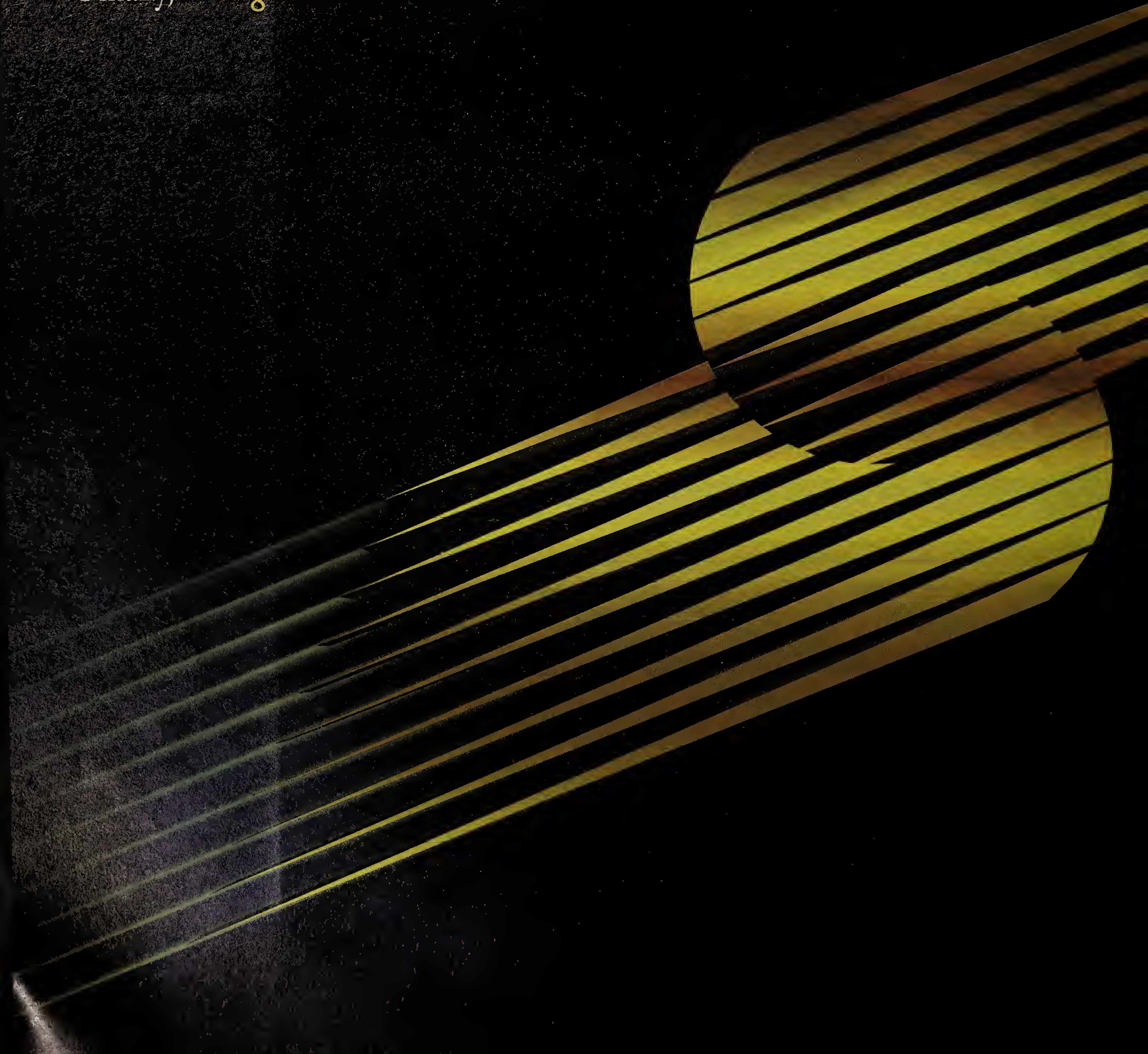
HP said it will enhance and market the software to telecommunications operators, application developers and equipment vendors as tools to fuel the **convergence of computing and telecommunications** by speeding application development for network operators.

Meanwhile, **GTE Mobilnet, Inc.** has begun testing the operational readiness of CDMA in Austin, Texas, using the **AT&T 5ESS-2000** switch — a first for the AT&T gear.

According to AT&T Network Wireless Systems, the carrier is looking to offer commercial deployment of CDMA — one proposal on the table for a standard for emerging broadband personal communications services — by midyear.

SYNTHESIS™

Finally, A *Migration Path* You Can Look Forward To.



What if you could reconfigure the network from your desktop, and broadcast storms and bottlenecks were a thing of the past? What if you could show the boss where WAN bandwidth was being wasted, create virtual workgroups on the fly, or move entire departments with the click of a mouse?

What if tomorrow's network could do this, and more, for less than it costs to run your network today . . . and someone could take you there with your existing investment intact?

Synthesis™ is Cabletron's strategy for combining next-generation switching technologies, enterprise management, and your existing SNA and LAN investment to create something entirely different: a network that knows no limits.

Synthesis™. It's where networking is heading. And only Cabletron has it.

SYNTHESIS

Find out more. Call for your informative whitepaper:
(603) 337-2801

YOU CAN GET THERE FROM HERE.

CABLETRON SYSTEMS
The Complete Networking Solution™

P.O. Box 5005, Rochester, NH 03866-5005

Circle Reader Service #29

CARRIER DEREGULATION

GOP takes stab at legislation for telecom reform

BY ELLEN MESSMER

Washington, D.C.

Hoping to rally Democrats to their cause for a bipartisan effort on telecommunications reform, Senate Republicans have unveiled a draft bill aimed at increasing local- and long-distance competition through deregulation.

Titled the "Telecommunications Competition and Deregulation Act of 1995," the proposed legislation would allow local exchange carriers into long-distance within three years if and when the bill is passed.

PRESSLER

The local carriers, in turn, would be forced to provide their would-be competitors with access to all their facilities and information on a fair basis, including databases, signaling, switching software and telephone poles.

State regulators would have the final word in interconnection disputes, court decisions notwithstanding. Failure to comply could lead to $500 million in fines through court action.

The proposed bill, put forward by Sen. Larry Pressler (R-S.D.), makes it clear that individuals who felt injured by Bell companies could sue for treble damages.

Unlike the Democratic telecommunications reform bill of last year that perished in last-minute blocking tactics by Sen. Robert Dole (R-Kan.), the draft bill also allows the utility companies to provide telecommunications services.

But similar to what was set forth in the Democrats' failed bill, the cable-telephone company restrictions would be lifted so cable companies could offer telecommunications services within areas they provide cable service, and telephone companies could offer cable in telephone service areas.

Cable rate regulation — a law spearheaded by Vice President Al Gore when he was a Tennessee senator — would be nullified. In addition, the Modified Final Judgment ban that kept the local Bell companies from manufacturing equipment would be lifted in three years.

The Bell companies, speaking in unison under the banner of the Alliance for Competitive Communications, objected to the three-year ban for their entry into long-distance while they have to open the local loop at once.

"True competition will come only when all players are allowed into all markets at the same time and under the same terms," said alliance chairman Gary McBee.

For its part, AT&T said the Bells should be allowed into long-distance if they meet the interconnection requirements but not at a preordained date of three years.

Accepting the fact that the draft bill will undergo changes, Republicans still hope to pass legislation by July 4. But the next few weeks may reveal whether the bill can gain the support of Democrats or if it will face the same kind of strong opposition that killed the Democrats' efforts last year.

Call centers

Continued from page 37

the B channels remain free.

"The benefit of that is that you're not using any of the internal tie lines before you really need them," Yardley said, noting that a 200-mile E-1 circuit in England costs about $120,000 per year.

GETTING THE SIGNAL

Northern's Virtual Network Services (VNS) can employ D-channel signaling in a similar fashion.

VNS, an enhancement to the company's existing private ACD networking capability, will emulate a private network by allowing ACDs to dial up one another over the public switched network in order to reroute calls by the time of day or skill group.

The ACDs then signal one another over ISDN D channels or through continuously open modem links, explained Gail Young, director of call center marketing for Northern's Multimedia Business Applications group.

Young conceded that dial-up rerouting of calls raises the possibility of double billing — once for the 800 call initiated by the customer and once for the ACD-to-ACD link.

Dial-up rerouting of calls raises the possibility of double billing — once for the 800 call initiated by the customer and once for the ACD-to-ACD link.

However, Young noted that multiple call centers may be located within the same metropolitan area, often eliminating a message toll. Switched rerouting through VNS can also be used as overflow to a private ACD network, saving the need for additional leased circuits.

THEY'RE COMPATIBLE

Also at the show, GeoTel of Littleton, Mass., announced that its Intelligent CallRouter software has met compatibility standards for use with AT&T's 800 Intelligent Call Processing service, which continuously links call center agent databases with the Network Control Points (NCP) in the AT&T network.

The Windows NT-based Intelligent CallRouter forwards agent data from multiple ACD platforms to the AT&T NCPs, while providing the call center manager with a single reporting image across sites.

The software is now in beta-test at four call centers operated by Private Healthcare Systems in Waltham, Mass. It has already cut daily report preparation by several hours a day, according to Lois Flowers, director of telecommunications for the company.

Is your LaserJet® tossed about in the turbulence of a complex network?
Our new Typhoon laser printers with VPT™ support 4 protocols and over 20 network operating systems. They'll handle your mixed-platform network.

Do you find your printer limiting?
You need the versatility and power of a new Typhoon 8, 16 or 20. We've got desktop printers that handle paper sizes up to and beyond 11"x17" with 3 input trays and resolutions up to 1200 dpi!

So forget the 'Jet.
Remember, even the biggest 'Jets stay in the hangar when a Typhoon's around. Call us to solve your printing problems.

1-800-980-0374

Dataproducts

©1995 Dataproducts Corp. Dataproducts is a registered trademark and VPT is a trademark of Dataproducts Corp. LaserJet is a registered trademark of Hewlett-Packard Company. Developer tested only. Novell makes no warranties with respect to this product.

Circle Reader Service #39

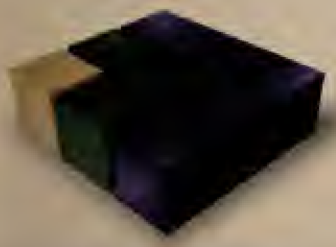
Don't just increase bandwidth. Control it. With the TigerSwitch™ XE.

Any LAN switch can offer increased bandwidth. The question is, how do you control that extra power?

The answer is simple. With the TigerSwitch XE from SMC.

Simply put, the TigerSwitch is the most powerful, most intelligent, most cost-effective LAN switch on the market today.

It offers unsurpassed capacity—with dual RISC processors, 24 ports, and 240 Mbps bandwidth all told. It's based on a store-and-forward architecture that maximizes throughput. And the TigerSwitch comes with a set of management features that no other LAN switch can match.



SMC UNITY
LAN Access
Bandwidth Acceleration
Intranetworking

They include support for over 8,000 MAC-layer addresses—so you can identify bottlenecks not just by segment but by workstation, too. A sophisticated package of "what-if" analysis tools, so you can assess the impact of changes in network design ***before*** you implement them. And the ability to define broadcast domains based on your network's traffic patterns—to enhance performance and erect firewalls against broadcast storms.

Add to this all the attributes you'd expect from an enterprise-worthy switch. 100% compliance with the Spanning Tree protocol. Complete compatibility with the Ethernet cabling, adapters, and hubs you have in place. And support for all the most popular network management systems (including HP OpenView, Sun's SunNet Manager, and IBM NetView/6000).

Best of all, the TigerSwitch provides this combination of raw power and refined control at a per-port price far lower than that of switches offering half as much.

If you're making the transition to LAN switching, call 1-800-SMC-4YOU, Ext. XE06, and ask for our free interactive tutorial on disk today.

We'll show you how the TigerSwitch can increase bandwidth on your network—and help you control it at the same time.

Frankly, a switching solution that offers anything less should give you pause.

SMC®

All trademarks and registered trademarks are the properties of their respective holders.
© Copyright 1995 Standard Microsystems Corporation.

Circle Reader Service #43

The kind of growth path you'll be on
with our new PowerPC SMP servers.

Future PowerPC 604 processor upgrade at no charge

Binary-compatible members of the IBM RISC System/6000® family, extending to the Scalable POWERparallel™ SP2

There *is* a difference.

Actually, "growth Autobahn" may be a more precise description of the first of a new generation of servers that run AIX®, IBM's version of the UNIX® operating system. These servers bring mainframe-level reliability to open computing, putting you on a growth path that's virtually infinite.

At their core is IBM's symmetric multiprocessing (SMP) architecture, harnessed to the PowerPC™ processor. With SMP, you can add PowerPC CPUs as your needs grow, starting with two and expanding up to eight. You can even upgrade to higher-performing PowerPC chips in the future.

Our SMP isn't just built for growth. It's also built for speed.

Unlike in other servers, memory access bottlenecks have been minimized. Each microprocessor can access memory concurrently without waiting. That's supercomputer-level capability.

Our servers also deliver reliability others don't. (That's part of our obsession with guarding your business-critical data.) With IBM SystemGuard™, an independent service processor automatically brings you back online if processor, memory, software, disk errors or power failures occur.

All these mainframe capabilities come in machines that run AIX. So networks can run everything from engineering and accounting applications to databases such as DB2/6000®, INFORMIX®, INGRES™, ORACLE®, PROGRESS® and SYBASE®.

If this is the path you want to be on, you can get more information through the Internet via IBM's Worldwide Web server at www.ibm.com, or call your IBM representative, IBM Business Partner or 1 800 IBM-6676, ext. 621.

THE NEXT-GENERATION
RISC SYSTEM/6000
SMP SERVERS FROM IBM

RISC System/6000 uniprocessor to SMP upgrades available

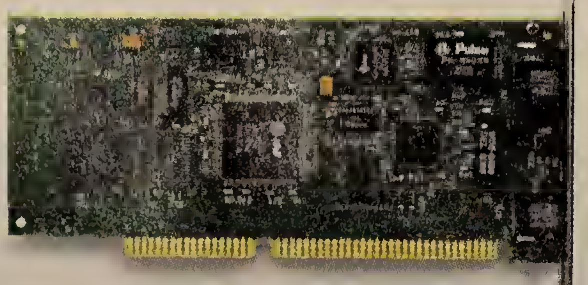
6.5% financing through IBM Credit Corp.*

IBM

*Financing will vary based on customer credit rating, financing terms and financing option 6.5% rate applies to best credit rating, 24-36 month term Offer applies to systems installed by January 31 1995 Restrictions may apply Offer may be withdrawn at any time IBM, RISC System/6000, AIX and DB2/6000 are registered trademarks and PowerPC, IBM SystemGuard and POWERparallel are trademarks of International Business Machines Corporation UNIX is a registered trademark in the U S and other countries, licensed exclusively through the X/Open Company Limited All other trademarks and registered trademarks are properties of their respective companies ©1994 IBM Corp

Bring 100Mbit/s to the desktop today, with HP's family of 100VG products.

There's a lot of talk about high-speed networks, but unfortunately, most of it's been just that–talk. At HP, we think it's time to cut through the hype and deliver a viable high-speed solution you can work with today. So no more chitchat, here's the real deal:



Our 10/100Mbit adapters leverage your existing investment in 10Base-T Ethernet, and allow you to choose either 10Mbit/s or 100Mbit/s for the speed of your LAN.

- 100VG products available now (ISA and EISA 10/100Mbit adapters, 15-port hub, and 10Mbit bridge/management card)
- Fits in your existing Ethernet network with little or no re-investment
  - Preserves all existing cabling (including UTP CAT 3 or 5); eliminates need for new cabling
  - Preserves all existing 10Base-T network topologies
  - Works with major network operating systems (NetWare, LAN Manager, Windows for Workgroups, Windows NT)
  - Supported by industry-standard SNMP management programs, including HP OpenView
  - Advanced traffic analysis capabilities with HP EASE Sampling
  - Supports IEEE 802.3 Ethernet frame types
- 100VG-AnyLAN Demand Priority technology does more than speed up your LAN, it:
  - Eliminates network collisions
  - Optimizes throughput
  - Guarantees a higher level of security
  - Minimizes delay for time-sensitive applications
  - Guarantees network access
- Priced to implement now*
  - $229 ISA 10/100Mbit adapters, $349 EISA 10/100Mbit adapters
  - $3,750 15-port hub

Perhaps best of all, these products come from HP, as part of our AdvanceStack family of networking solutions. For fast faxed information, call 1-800-964-1843, or for more information, 1-800-533-1333, Ext. 8463†. Just say you want the facts, and nothing but.

Another smart networking product from HP.

EDITOR REFUSES TO GIVE IT BACK
NETWORK COMPUTING

HEWLETT®
PACKARD

*U.S. list price as of 12/1/94. †In Canada call 1-800-387-3867, Dept. 8463.
Windows is a U.S. trademark of Microsoft Corporation. UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Company Limited.
©1994 Hewlett-Packard Company RND010

IBM Global Network to host apps and gain cellular links

Encourages users to fully outsource applications.

BY JOANIE WEXLER

The IBM Global Network (IGN) is struggling to become a networking services contender for the corporate masses, with plans to host groupware applications such as Lotus Notes and provide cellular access to various services this year.

IGN, which serves largely Systems Network Architecture customers worldwide and is administered by the IBM-Sears, Roebuck and Co. joint venture Advantis in the U.S., is already offering Notes services to IBM internally and is piloting them with other customers, said John Whiteside, IGN general manager.

The company joins the ranks of AT&T, CompuServe, Inc. and WorldCom in saying it will host Notes and other groupware applications in its backbone (*NW*, Jan. 23, page 31), alleviating that burden from companies that do not want to tie up human resources, capital and floor space.

A firewall product announced by IBM at the ComNet '95 trade show last month will help in the Notes rollout. It will allow IGN "to open up this capability commercially throughout 1995" as well as host users' customer-designed applications on a partitioned server, Whiteside said.

This means users could entirely outsource server and application maintenance to the IGN, he said.

"To attract users and developers, we must demonstrate that we can get the user to the application from anywhere," IGN's Whiteside said.

IBM's firewall, called the NetSP Gateway, is software that enforces network access rights based on user-determined rules and takes action when rules are tested or violated (see story, page 37). Such capabilities are at the heart of any carrier's ability to provide secure services in shared public networks.

Further blurring the boundaries between traditional transport carriers, such as AT&T, and value-added network service providers, IGN is also stepping up to the plate to offer wireless links into its backbone of utilities, services and applications.

At the Cellular Telecommunications Industry Association (CTIA) annual conference late last month, IGN announced it has teamed with GTE Personal Communications Services to provide cellular access into the IGN net.

MOBILE USERS

Both circuit-switched analog and IP-based Cellular Digital Packet Data (CDPD) links will be available via GTE. The latter will be enabled by Advantis Passport, CDPD client software for portable computers that was launched at the CTIA show by Advantis.

This means, for example, that mobile users with an IBM ThinkPad portable and a CDPD modem will be able to access their SNA applications on the IGN, with IGN handling the IP-to-SNA conversion, said Mike Abrams, manager of market development for Advantis' mobile services group.

Cellular links into IGN will be commercially available for cc:Mail, Prodigy Services Corp. and IBM Professional Office System (PROFS) mail clients in the first quarter, and for electronic data interchange applications later in the year, Whiteside said.

The Passport software encrypts user data over the dial portion of a transmission — the access leg of the trip into the IGN. The Passport interface is a 3270 emulator.

"To attract users and developers, we must demonstrate that we can get the user to the application from anywhere," Whiteside said. Likewise, proactive applications — those written to seek out users and notify them of pending information or messages — require wireless links, he noted.

Also, GTE said it will remarket some of the IGN's services to existing and prospective mobile data customers.

Whiteside said IGN intends to be vendor-neutral in partnering with other wireless carriers for access. GTE became IGN's first partner because it is the least regulated cellular carrier with the largest footprint to date, he said.

IGN intends to follow the same philosophy in supporting groupware applications in the network. For example, "If Microsoft Exchange is in demand as an engine, then we'll support it on the IBM Global Network platform," Whiteside said. ⧉

TELEPHONE
Call
1-800-444-7854
for your free Bandwidth Optimization Kit!

Introducing Danube.
The first big-time router that fits tight branch office budgets.

Complete branch office routing – *under* $2000!

Don't let the price fool you. It's not just a bridge. The new ACC® Danube™ is a full-featured, plug-and-play router.

And don't let the size fool you. Danube is smaller than your letterhead — but it's packed with all the features you want in a branch office router. And don't bother looking for anything even close in quality or price. Danube is in a class by itself.

Just look at what comes standard in every Danube. One LAN and one WAN with full-fledged routing protocols, ready to meet your wide area needs from frame relay to ISDN. External power supply. Silent no-fan operation. And easy installation.

Plus, Danube includes all of ACC's advanced Bandwidth Optimization™ features. Data compression to slash WAN link charges. Express Queuing™ to prevent access delays. Dial-up features. Filtering. Everything you need to achieve the lowest possible operating costs in the months ahead.

All for less than $2,000, the lowest ready-to-run price in the industry. No bait. No switch. No surprise add-ons. And no waiting. Danube is available now.

If you think that's an unbelievable bargain for your branch offices, call 1-800-444-7854 today and give a Danube a run for your money. A little Danube will make a big impression.

ACC
A NEWBRIDGE AFFILIATE

© Advanced Computer Communications. ACC is a registered trademark and Danube, Bandwidth Optimization and Express Queuing are trademarks of Advanced Computer Communications, 10261 Bubb Road, Cupertino, California, 95014.
ACC contributes monthly to the African Wildlife Foundation for the preservation of the elephant and its habitat.

Circle Reader Service #45

SOS

Continued from page 37

premises for a monthly fee of $700 to $1,400 per site, said Robert McKinney, CompuServe's manager of internetworking services. For now, CompuServe does not offer firewall services from its own site.

Internet provider Advantis uses IBM's NetSP Gateway firewall to give customers a secure presence on the Internet's World-Wide Web, said Kim Benson, product manager for Advantis Internet Services. Only the customer's home page and a subset of its data can be accessed from the unsecured part of the 'Net, protecting the rest of the corporate network, Brown said.

Security blankets

A sampling of Internet services providers and their security options.

	Consulting/ security audit	Firewall	Encryption	Onetime password generation
Advantis	✓	✓		
BBN	✓	✓	✓	✓
CompuServe	✓	✓		
Sprint				
UUNET	✓	✓	✓	

Perhaps most importantly, BBN and others, such as UUNET Technologies, Inc. in Fairfax, Va., will provide security audit services to help users determine policies and procedures that they or their provider can then implement with technology such as firewalls or encryption.

"We tell people what not to do so they can practice 'safe Internet,' " said Alan Taffel, UUNET vice president. A security audit from UUNET costs several thousand dollars and could include suggesting UUNET's own Lan Guardian encryption product, or security products from other vendors.

But first and foremost, an audit helps users define safe behavior.

For example, a breach reported last month resulted from "address spoofing," where an intruder forged a user's IP address (*NW*, Jan. 30, page 1). In that case, the victim made a dial-up connection, entered his password and went on vacation with the link still up.

Advice against such activity would be integral to a security audit, Taffel said. ◼

'Follow-me' phone numbers available

BY TIM GREENE
AND JOANIE WEXLER

Local exchange carriers (LEC) are starting to roll out 500 phone numbers that seek out the customers that hold them.

Acquiring this feature in the form of a carrier service is just one option open to users who want a single phone number that follows them from place to place. Spurred by Federal Communications Commission approval this month, LECs have prepped their switches to support access for interexchange carriers (IXC) that want to provide 500 service.

So far, the only nationwide service ready to go is AT&T's True Connections, which lets 500-number customers program AT&T's platform to route incoming calls to specified devices, including cellular phones, fax machines and personal computers, in the U.S. and 200 other countries.

The service can call the programmed numbers in sequence, and allows the customer to change which numbers ring and in what order.

AT&T's 500 tariff went into effect late last year. But without the local loop connection, the service has been undeliverable.

The regional Bell operating companies report that other IXCs have shown interest in seeking local access for 500 service, including MCI Communications Corp. and Sprint Corp., but not formally.

AccessLine Technologies, Inc., which provides the hardware and software that carriers need to offer 500 services, has a deal with one IXC that will be announced next quarter, said company President Daniel Kranzler.

AccessLine offers an application that differs from the AT&T 500 offering in that it can screen calls so only callers who have the customer's personal code can get through directly. It also can be configured to bill individual calls either to the caller or the customer.

Other vendors are marketing hardware and software that let users set up their own 500-like services.

Priority Call Management, Inc.'s MSX System, for example, lets a customer receive phone calls through a single number and have them rerouted virtually anywhere.

MSX can be installed at the cus tomer's private branch exchange o within the networks of wired an wireless service providers. Pricin for the systems starts at $60,000.

Potential follow-m service users includ businesses whose em ployees might hav several individual tele phone numbers o those whose employ ees change location fre quently. They also ma want to give their cus tomers the conve nience of remember ing only one phon number.

Cross Countr Healthcare, based i Boca Raton, Fla., plan to use AT&T 500 ser vice.

The firm place temporary health car personnel on 13-wee assignments in cities nationwid requiring workers to move from on place to another — and change phon numbers — about four times a yea said Jonathan Ward, vice presiden of marketing at the recruitmen agency. ◼

About-face

Companies wishing to assign 500 numbers to employees might have to deprogram their PBXs from blocking numbers with 500 area codes, according to George Ryva, networking technical manager at AT&T Bell Labs.

500

STARTS HERE.

PSINet *is* THE LEADER IN CORPORATE INTERNET ACCESS AND INTEGRATION

All it takes is one phone call to a PSINet® Internet sales consultant to understand how your company can integrate its LAN into the worldwide Internet. PSINet is the largest Internet provider in the world. We specialize in connecting networks of any size to the Internet-- from the smallest LAN to the largest enterprise network. Let us bring Internet support to your business activities. PSINet uses only tested and approved technologies, including analog and ISDN dialup, as well as dedicated leased line services. Whether your organization is considering casual, "on-demand" access, or 24 hour high-speed attachment, we have a service that can work for you.

One call to PSINet and find out why the Internet starts here.

1.800.82.psi.82

Voice: 1.800.827.7482 / 1.703.709.0300 • FaxBack: 1.800.faxpsil • World Wide Web: http://www.psi.net/

© 1995 by Performance Systems International, Inc. PSINet and the PSINet logo are registered trademarks.

BRIEFS

Informix Software, Inc. of Menlo Park, Calif., last week posted revenue of $150 million for the fourth quarter of 1994 ended Dec. 31, up about 48% from the fourth quarter of 1993. The database maker, which had 1994 fiscal year revenue of about $468 million, said its database business increased 60% and its tools business grew 20% over 1993 totals.

Informix: (415) 926-6000.

Spry, Inc. of Seattle last week announced a **World-Wide Web server** aimed at ensuring secure commercial transactions over the 'Net. SafetyWeb uses a form of Secure HyperText Transfer Protocol, a standard developed by Terisa Systems, Inc. that relies on public-key encryption. SafetyWeb is available for beta-testing on Unix machines and can be retrieved at **http://www.spry.com** via the Web. Pricing and general availability was not announced.

Spry: (206) 447-0300.

Process Software, Inc. of Framingham, Mass., last week said it would begin shipping a **World-Wide Web server** for Windows NT in March. Its Purveyor 1.0 can run on both Intel Corp. and Digital Equipment Corp. Alpha platforms. It includes the ability to limit access to specific documents by IP address and user name, and supports proxy servers. Pricing starts at $1,995 per license.

Process Software: (800) 722-7770.

Database vendor **Sybase, Inc.** of Emeryville, Calif., last week formed the **New Media Division** to develop software for companies doing business on the Internet and commercial on-line services. The new division will also oversee development of Sybase's current offerings for building multimedia applications – Intermedia Server and Gain Momentum.

Sybase: (510) 922-3500.

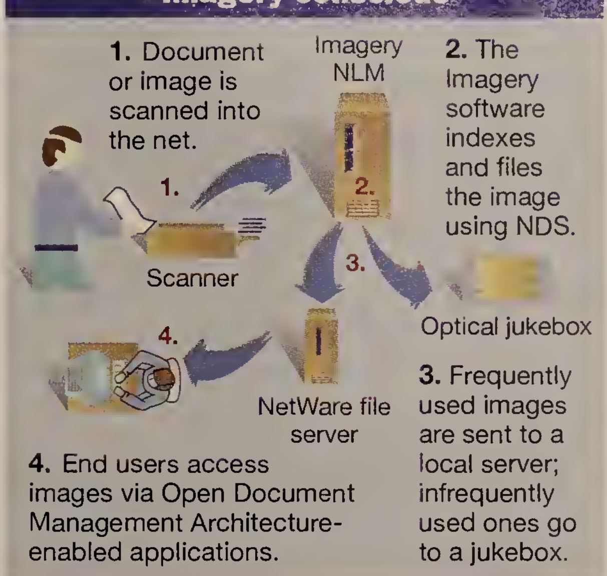
Kodak unit develops imaging tools for departmental LANs

BY ADAM GAFFIN

Bedford, Mass.

Imagery Software, Inc. is striking out on its own with a set of imaging tools aimed mainly at departmental LANs.

Imagery-conscious



1. Document or image is scanned into the net.

2. The Imagery software indexes and files the image using NDS.

3. Frequently used images are sent to a local server; infrequently used ones go to a jukebox.

4. End users access images via Open Document Management Architecture-enabled applications.

The product introduction marks somewhat of a departure for the Eastman Kodak Co. subsidiary, which up until now has been known largely for its work with Novell, Inc. on image-enabled NetWare (Image and Document Management Services) and with Lotus Development Corp. on Lotus Notes: Document Imaging.

Imagery's GroupStore includes a NetWare 4.1 server component and Windows-based client code.

The server software, designed as a NetWare Loadable Module, provides image and document management functions. It indexes incoming files and forwards them to file servers across a network based on criteria set by an administrator. It includes a hierarchical filing system for migrating infrequently used images from network servers to other storage devices, for example, optical jukeboxes. As images are moved around a network, the software maintains logical links to them so that users do not have to hunt for them.

Unique to the software is its reliance on the NetWare Directory Service to keep track of images and their location on the net.

An Imagery for Windows client lets end users find and view images, as well as create and annotate these files. A separate client application for scanning supports a variety of scanning and input devices. The software sup-

See **Imaging**, *page 50*

DISTRIBUTED COMPUTING

Vendors opening up Windows to DCE

BY BARB COLE

La Jolla, Calif.

The Open Software Foundation, Inc.'s (OSF) Distributed Computing Environment (DCE) is making its way to the desktop.

That is the message vendors had for attendees gathered here last week at Decorum '95, a conference promoting DCE usage.

DCE is the OSF's set of integrated security, directory and transport services for building and managing distributed applications.

Several vendors, including show sponsor Transarc Corp., announced plans to migrate their DCE wares to the Windows and Windows NT operating systems. Until now, DCE has been mainly a Unix technology.

"Windows NT is the next natural frontier for DCE. As NT becomes more stable, more and more third parties will write applications for it, and it will become more widely used," said Janet Constantine, an analyst at The Yankee Group in Boston.

Transarc's new offerings include Encina for Windows NT Server, a version of the company's transaction processing monitor for Windows NT that is scheduled for a third-quarter rollout. Pricing was not available.

Transarc also said it will resell Gradient Technology, Inc.'s PC-DCE software, which gives Windows 3.1 users DCE security and communication services.

DECORUM '95

Alfred Spector, Transarc's chief operating officer said the firm is developing light client software capable of running DCE and Encina services. Code-named DE-Lite, the software will run on personal computers and personal digital assistants that want to use DCE services but have limited computing power.

DE-LITEFUL FEATURES

DE-Lite will consist of client software and a gateway. The client will access DCE and Encina services through a DCE-enabled server running the DE-Lite gateway software. DE-Lite will support Windows 3.1 clients initially, and Windows NT and Windows 95 later. It will ship at an unspecified time this year.

Other announcements at the show included:

■ Locus Computing Corp. of Inglewood, Calif., announced a version of its PC-Interface file system for the DCE file system.

The software will give Windows and other client operating systems that lack native DCE support access to DCE servers. Expected to ship in the first half of 1995, single-user licenses of PC-Interface start at $279; substantial discounts will be available on multiple client licenses.

■ JYACC, Inc. of New York is shipping JAM/Transaction Processing interface (TPi), client/server software that lets developers using the JAM application tool build code for Encina servers. The JAM/TPi lets developers partition client/server application code between client and server machines. The client software starts at $2,600 for Windows and $7,800 for Unix; server software starts at $8,000.

©Trasarc: (412) 338-4404; Locus: (310) 670-6500; JYACC: (212) 267-7722.

Platinum's shopping spree

January 1994	September 1994		December 1994
▸ Purchases Datura, a maker of database administration tools for relational databases.	▸ Swallows Dimeric Development, which makes administration tools for Oracle databases.	▸ Buys out systems management software provider Aston Brooke Software.	▸ Snaps up AutoSystems, which makes Unix-based job scheduling software.

Platinum attempts to show system management mettle

BY BARB COLE

Oakbrook Terrace, Ill.

Platinum Technology, Inc. has acquired a provider of job scheduling software as part of its push into the systems management arena.

By adding AutoSystems Corp. of Boulder, Colo., to its stable, Platinum has made another move toward assembling a line of products to distribute, monitor and control applications across corporate networks, said Andrew J. Filipowski, Platinum's president and chief executive officer.

"We see a tremendous opportunity to give people working in the Unix environment the kind of control they had in the mainframe world," Filipowski said.

Terms of the agreement, completed in December last year, were not disclosed.

Platinum's business traditionally has been one of selling relational database administration tools, as well as middleware, to connect mainframe and server databases from multiple vendors. Since the start of 1994, the company has gone on a shopping spree to supplement its product line with a suite of systems management software designed to work in both mainframe and Unix environments (see graphic, this page). Platinum has yet to detail how products from the companies it has acquired will work together.

The acquisition of AutoSystems brings Platinum a product called AutoSys, a client/server system that schedules batch jobs running on Unix servers. The software runs on several Unix server platforms as well as Windows

See **Platinum**, *page 50*

SHARED LOGIC

by Marc Myers

Client/server computing in the year 2010

"Wake up, Daddy! A big bug is in the bathroom!"

My 4-year-old daughter had a firm grip on my right big toe, but I knew it was much too early to have breakfast, so I tried to ignore her.

This is how my day started on Saturday, Feb. 13, 2010. Another bathroom bug. I yawned and stretched while the Sleep Deactivation Unit stored my dream cycle data. I should review the analyses more often to find out why I'm so stressed, but psychological data is so boring.

Oh yeah, the bug. I trudged down our narrow hallway to the bathroom and went in for a look. Sure enough, building maintenance had screwed up again. The prompts were stuck in an endless loop, and the smiling actress in the hologram was repeating over and over, "Remember to put your toothbrush in the dentalyzer when you finish brushing. Remember to..."

I guess it's important for the kid to develop good habits. But sometimes I wonder if all these prompts just make us automatons. And the poor kid is really scared of bugs.

So I voice-opped the bathroom mirror, and it brought up the user-level programmatic interface for "3- to 5-year-old morning/bathroom." Most people would just turn the thing off and call maintenance, but I'm a programmer by trade and if I can't handle an errant domestic program, what good am I?

I ran an autodetect on the code and didn't find anything. That's normal though because most of the generic domestic programs don't spend the processing power required to perform full autodetection — it's too expensive for most people, including me.

"Daddy, did you kill the bug? Did you?"

I sighed, "Yes, honey, it's OK now. Finish up in here and then hurry up or you'll be late for school. I'll start breakfast."

I quickly combed my hair before invoking the message maker, also located in the bathroom mirror. I put it into full translation mode since our concierge worked out of a central office in Brazil and didn't speak much English. "Hey, Vicente, this is Marc. Well the toothbrushing program is broken again. It's really got my kid freaked out, so maybe you could find something more stable and put it in our rental package. Thanks."

I went down the hallway to the next door and squeezed myself into our multipurpose room. I can remember when you didn't have to walk sideways through doorways. I can even remember when there were overweight people because chemical balancing had not been discovered. As I started up breakfast, the prompt — a homely looking fellow in a white lab coat — asked me to put my hand on the scanner. The system "scanalyzed" my chemical balance and started breakfast.

Afterward, I helped my daughter into her school chair. She strapped on her headset and suddenly became quiet as her nursery school day began. Because our middle-economy apartment required us to share the local server, it was easy to sneak into her school program to see what she was learning. They're already teaching her how to design systems using codeless programs that self-modify.

You see, I'm a maintenance programmer responsible for programs that keep the atmosphere regenerators running, and that code is a throwback to the old days — no autodetect or self-modification features, just plain old uncommented code.

I sat down and put on my headset. Suddenly, I found myself sitting in my cube at the office and looking at my to-do list: A regenerator in Sector 6 had been making strange noises, and the locals were complaining. I took a deep breath and started a message to my boss: "Morning Charlie, this is Marc. Got the news on Sector 6. Should have this bug squashed by mid-morning."

➾ Myers is president of Client/Server Connection, Ltd., a Cambridge, Mass., firm specializing in client/server software solutions. He can be reached at (800) 622-1108, Ext. 522, or via CompuServe at 71332,1726. Myers' column alternates in this space with that of META Group's Mike Rothman.

NETWORK WORLD TECHNICAL SEMINARS

Managing the Migration to Client/Server Networks

Client/Server Architecture clearly responds to today's business demands for flatter/decentralized organizations, faster-paced operations, and broader data access for end-users. However, managing the migration to client/server distributed systems requires rigorous preparation and planning. Information Systems and Network Managers must select and execute implementation projects carefully, keeping focused on applications which will most improve user productivity and effectiveness.

The new generation of client/server computing can yield tremendous benefits for the organization but only upon selecting and applying the appropriate design considerations and management methodologies. While traditional models serve as a useful guide, many aspects are new and radically different. The addition of JAD, RAD, and Spiraling methodologies provide powerful new tools which require new perspectives on managing and implementing distributed architectures.

This intense two-day seminar, directed and taught by Robert L. Christian, provides you with a thorough understanding of the state-of-the-art of client/server design and implementation. Four real-world client/server implementation projects will be reviewed via detailed case studies on the methodologies used for successful implementation. The entire project life cycle will be examined with specific emphasis on JAD, RAD, and Spiraling for application delivery. Eight live demonstrations will also be presented of the most significant client/server design and development tools.

Attending this two-day seminar will help you . . .

- Understand the management and technology issues associated with next-generation client/server architectures
- Develop migration strategies for applications, networks, and databases
- Select the required development methodologies
- Determine how the WAN needs to be re-engineered to support client/server applications
- Identify the true costs associated with client/server delivery projects
- Effectively select appropriate design, development, and analysis tools
- Analyze what internetworking devices are appropriate for client/server deployment
- Plan when and how the network infrastructure should be installed
- Design a support organization for distributed computing environments
- Design an enterprise data warehousing strategy for data capture and distribution

$895.00 Registration Fee Includes . . .

- Comprehensive seminar workbook
- Copy of exclusive *Client/Server Migration Planning & Product Guide*
- Copy of *Essential Client/Server Survival Guide*
- Exclusive *Client/Server Migration* CD-ROM packed with Client/Server software utilities and tools
- Luncheons and break refreshments

Note: If you can't attend, a full attendee materials kit is available for just **$99.95!**

Call **1-800-643-4668**

Register today for the seminar nearest you!

Co-sponsored by:
COMPUTERWORLD
CLIENT/SERVER JOURNAL

Seminar Dates & Locations

March 14–15	Chicago, IL
April 5–6	Boston, MA
April 10–11	Los Angeles, CA
April 12–13	San Francisco, CA
April 18–19	New York, NY
May 2–3	Washington, DC
May 8–9	Atlanta, GA
May 10–11	Dallas, TX

E-mail your request for information to

seminars@idg.geis.com

to automatically receive an e-mailed version of our seminar brochure. Please put the word "migration" in the subject field.

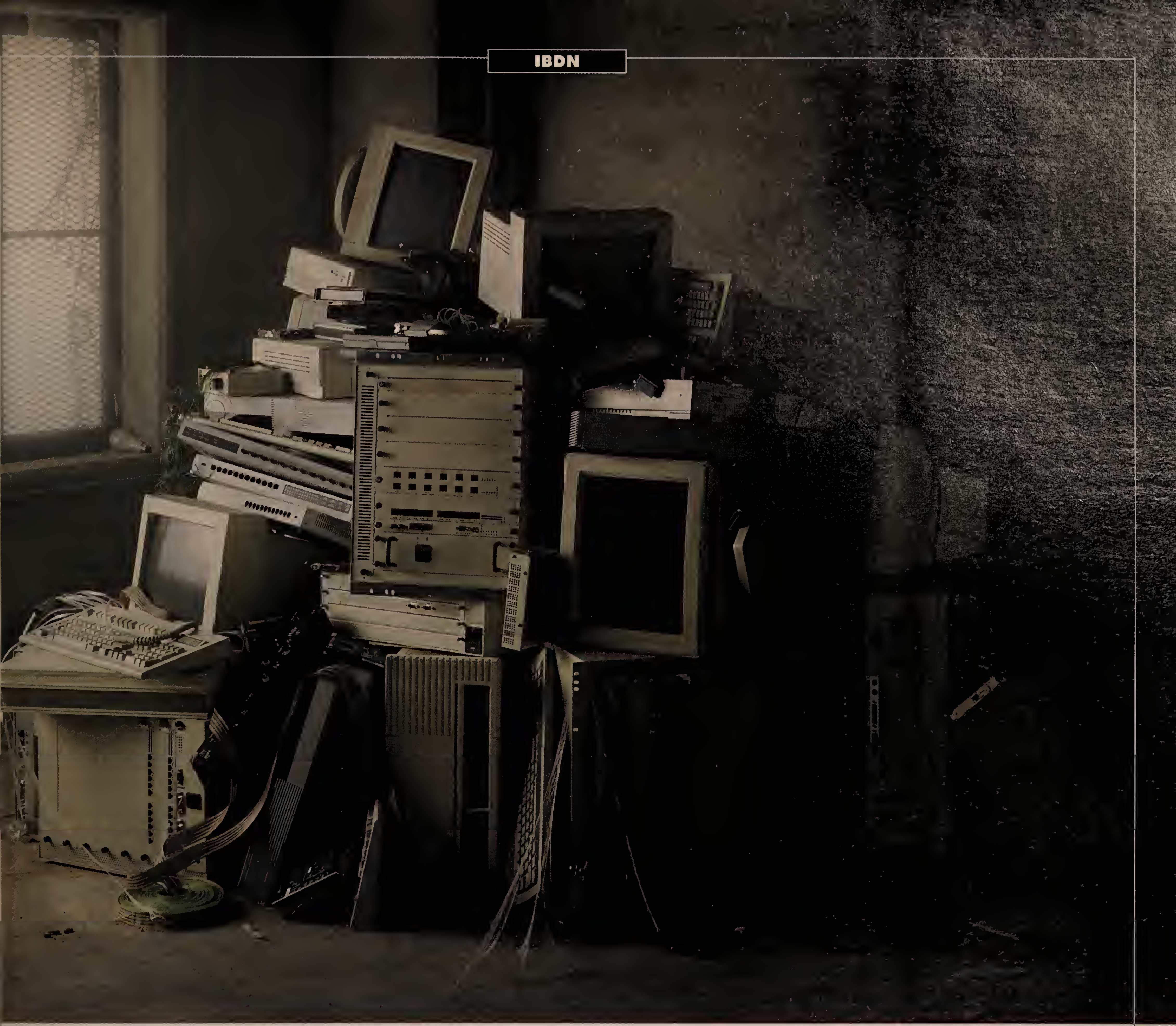
Dial Our **FAX-BACK** Information Line at

800-756-9430

for a complete seminar outline and registration form. When prompted, request document #40.

Directed & Taught by Robert L. Christian, Next Generation Technology

IBDN



IT'S 2010. ABOUT THE ONLY THING YOU HAVEN'T HAD TO REPLACE IS YOUR CABLING SYSTEM.

Other data technology comes and goes but an IBDN structured cabling system keeps performing. We certify it. Our certification means a lifetime application assurance program that includes everything you're running today and future applications like 100Base-T Ethernet and 155 Mbps ATM. There's even a 15-year warranty on all passive components. Sure we're Category 5, but we go beyond that to what really matters – how well your network performs. To learn more about IBDN and Northern Telecom's unique certification program, call 1-800-262-9334. And in 2010 the cabling system you buy now can still be on the job, instead of on the heap.

IBDN Certified
FOR WHAT'S COMING NEXT

nt northern telecom

©1994 Northern Telecom
IBDN is a trademark of Northern Telecom

Circle Reader Service #33

Novell to integrate voice mail and E-mail

BY ADAM GAFFIN

Palm Springs, Calif.

Novell, Inc. last week announced plans to support voice mail and electronic mail on a common file server accessible both by phone and personal computer.

The company will release new software, code-named Alex, that leverages third-party hardware to move voice messages from a private branch exchange to a NetWare file server already housing E-mail messages. Users can then access any of their messages either from Novell's PC-based GroupWise E-mail package or via a push-button phone.

Alex — which will debut at the Demo 95 conference here — will rely on the Simplified Message Desk Interface, Novell's Telephone Access Server and Voice Technologies Group, Inc.'s VoiceBridge switch to route incoming voice messages from any of seven major PBX brands to a NetWare server.

Desktop users will be able to have their voice mail read to them through their computer's speakers or have Alex dial their desk phone and replay their voice messages. Remote callers will be able to retrieve their voice mail and have their E-mail read to them by a speech synthesizer.

Lotus Development Corp. and AT&T recently announced a similar package for Lotus Notes that relies on extensions to the X.400 Application Program Interface Association's (XAPIA) Common Messaging Calls (CMC). Novell argued that its package relies on established standards and lets users get rid of expensive voice mail storage devices in favor of less expensive network file servers.

Lotus and AT&T, however, said their system gives users more flexibility in determining where to store messages and how to access them. They also will offer their CMC extensions to the XAPIA and the Electronic Messaging Association, which is working on possible standards for universal messaging systems.

Alex will ship in the second half of the year at a price to be determined.

✆Novell: (800) 638-9273.

NETWORK WORLD Satellite Seminars

THE Electronic COMMERCE SERIES

CAPITALIZING ON THE Internet

A Live Three-part Satellite Seminar Series. It's no longer news to anyone that the Internet represents an incredible opportunity for businesses and organizations to enhance communication and gain competitive advantage. The astonishing growth of the Internet as an essential business tool creates an immediate need for your organization to develop new knowledge and skill.

Developed by *Network World* and the Computer Television Network, the Electronic Commerce Series serves the growing demand for information and education on the emerging Electronic Marketplace. *Capitalizing on the Internet*℠ is a three part live satellite-delivered seminar series which covers the Internet as an emerging force in business and marketing and will help you determine how your organization can most effectively participate.

This timely seminar series will provide you with the knowledge and direction you need to successfully evaluate the myriad of new electronic commerce opportunities. *Capitalizing on the Internet* presents you with an unparalleled opportunity to understand, develop the vision for and implement your plan to do business on the Internet.

Capitalizing on the Internet will help you . . .

- Understand how business is conducted on the Internet
- Evaluate which electronic business models might work for you
- Determine the best Internet connection options and value for you
- Understand the tools: Gopher, Mosaic, FTP, WAIS, telnet, World Wide Web, Cello, E-mail and more
- Find out how to tap into the over 20 million users of the Internet
- Learn how to promote your Internet presence both on and off the net
- Learn what the Internet community finds acceptable when doing business
- Understand the terminology and culture of the Internet
- Develop your business case for doing business on the Internet
- Learn about emerging technologies and standards that could affect your business presence on the Internet
- Learn from the experiences of the Internet business pioneers

Program Information

Capitalizing on the Internet features three two-hour telecasts that can be received by satellite downlink equipment via the C and Ku bands. All programs are broadcast from 1:00 PM to 3:00 PM EST. Phone, fax and e-mail access to our production studio is provided to allow interactive feedback.

If your organization is not satellite enabled, call and we will refer you to a site in your area that is.

Program I: A Business Guide to the Internet March 16, 1995

Program II: Internet Business Tools April 20, 1995

Program III: Building Your Internet Business Case May 4, 1995

A full site license to downlink this exciting three-part series costs just $1595.00 and includes ten complete viewer materials kits consisting of the following: (additional materials kits available for nominal fee)

- Comprehensive 200-page viewer guidebook with a full set of seminar materials including slides and speaker notes, papers on "Creating Your Internet Business Plan," a comprehensive list of software programs and tools for creating Internet applications, an annotated list of books, articles, and other resources, a listing of the 100 best online resources on developing, implementing, and managing Internet business applications, and much more.
- *Capitalizing on the Internet* CD-ROM, packed full of hundreds of megabytes of Internet tools, utilities, and valuable information resources.

Hosted by recognized Internet expert Mark Gibbs, this series will also bring you important information from live guests such as:

Mary Cronin, author of *Doing Business on the Internet*
Marc Andreessen, VP of Technology, Netscape Communications Corporation
Bob Metcalfe, VP/Technology, IDG, industry visionary, pioneer of network computing
Martin Nisenholtz, Director of Content Strategy, Ameritech
Glenn Fleishman, President, Point of Presence Company
Mary Morris, author of *HTML for Fun and Profit*
Greg Bean, author of *Building Internet Servers*
Dave Taylor, co-author of *Internet Business Guide*, creator of the Internet Mall
Susan Estrada, author of *Connecting to the Internet* and creator of NetPages

Why Satellite-Based Training?

- Cost-effectively train large groups of your staff
- Bring renowned Internet experts to your audience
- Discuss issues raised in the seminar in a confidential, secure environment
- Create a promotional "event" around the seminar for your customers or clients
- Enhance the national broadcast with your own on-site programs

For more Information or to License this exciting satellite seminar series . . .

Call 800-643-4668

Dial our Fax-Back Information Line 800-756-9430 for a complete seminar series outline and license form. (When prompted, request document #70.)

E-Mail us at seminars@idg.geis.com for our electronic brochure and license form. (Please put the word "satellite" in your subject field.)

Sponsored By CONNECT with Rockwell

Produced By CTN & Network World

Imaging

Continued from page 47

ports a variety of image formats, including Microsoft Corp. Bitmaps, the Graphics Interchange Format, the Joint Photographic Experts Group File Interchange Format, Tag Image File Format, PC Paintbrush and Targa.

While Imagery provides a complete client/server package, company President David Lakness said that because the software conforms to industry standards, users can swap out Imagery components with standards-compliant imaging software from other vendors.

Under consideration for future versions of GroupStore is closer integration with workflow applications, Lakness said. The initial release supports such integration via Microsoft Corp.'s OLE 1.0.

Bob Larrivee, an industry analyst for BIS Strategic Decisions, a Norwell, Mass., market research firm, said the open design of Imagery's software should appeal to companies that may already have some imaging software in place. "I think they have a winning approach" with this modular design, he said, adding that the one potential caveat is seeing whether the software can withstand the rigors of daily use.

Pricing starts at $395 for a client license, $7,995 for a server license and $1,995 for one license for the scanning software. The software is available now.

✆Imagery: (617) 275-7700.

Platinum

Continued from page 47

and Motif clients, and Platinum plans to port the software to MVS. AutoSys works with Oracle Corp. and Sybase, Inc. databases and will soon support Informix Software, Inc. databases, according to Filipowski.

Susan Hoelig, a Unix administrator at Moore Business Forms, Ltd. in Grand Island, N.Y., said good system management tools are necessary to make downsizing projects go smoothly. The lack of such tools made it difficult for her company to downsize a mainframe application to Unix-based Oracle servers.

Major relational database providers have promised such tools, but analysts and users are skeptical as to how well the tools will work across heterogeneous database environments.

Analysts said Platinum is focused on an important client/server area but questioned whether the company has the resources to juggle all of its recent acquisitions. Nevertheless, Platinum is not done spending.

Filipowski said the company is on the lookout for client/server backup, recovery and security software.

✆Platinum: (708) 620-5116.

NETWORK WORLD TECHNICAL SEMINARS

The explosive growth of high bandwidth voice, video and data communications presents formidable challenges for today's businesses. ATM, Frame Relay and SMDS help enable companies to implement these high bandwidth applications.

Analyzing Broadband Networks: Implementing ATM, Frame Relay & SMDS is a powerful two-day seminar that will provide you with a detailed understanding of Asynchronous Transfer Mode (ATM), Frame Relay and Switched Multimegabit Data Service (SMDS) technologies. Learn how to incorporate the various Local Management Interfaces and Customer Network Management into your broadband network architecture. Examine case studies, illustrated with protocol analyzer data, that demonstrate the operation of these protocols in depth.

Directed and Taught by Mark A. Miller, author of seven best-selling books on internetworking technologies and one of our most popular presenters, this seminar teaches you the details necessary to implement broadband networks. This seminar will help you get beyond marketing hype and thoroughly understand broadband architectures and protocols.

Analyzing Broadband Networks

Implementing ATM, Frame Relay and SMDS

Attending this 2-day seminar will help you . . .

- Compare the technologies and operation of ATM, Frame Relay and SMDS.
- Evaluate the application/technology matrix — which broadband technology is best suited to your specific applications.
- Discover the driving forces behind ATM, and how cell switching technology is revolutionizing business communication.
- Prepare for the next generation of internetworking challenges: Frame Relay/SMDS, Frame Relay/ATM and SMDS/ATM connections.
- Learn the signaling protocols that are used to establish ATM or Frame Relay connections.
- Understand the differences between circuit switching, packet switching and cell switching.
- Consider broadband network management architectures and protocols, such as the Local Management Interfaces (LMI), and the Customer Network Management (CNM) systems.
- Contrast the operation of Frame Relay and X.25 protocols.
- Learn how existing transport technologies such as TCP/IP and Novell's NetWare can be integrated with broadband protocols.
- Understand how SONET and fiber optic transmission will fit into broadband networking.
- See how SNMP will play a key role in broadband network management.
- Evaluate the broadband service offerings from the Local Exchange Carriers (LECs) and Interexchange Carriers (IXCs).
- Discover the roles of the broadband implementers: the ATM Forum, the Frame Relay Forum and the SMDS Interest Group.
- Obtain the status of the current standards for ATM, Frame Relay and SMDS.

$895.00 Registration Fee Includes . . .

- Comprehensive seminar workbook
- Copy of *Analyzing Broadband Networks* by Mark A. Miller
- 4 exclusive Protocol Reference Guides: Frame Relay, ATM, SMDS and SONET
- Support disk packed with reference documentation and standards supporting Frame Relay, SMDS and ATM

NOTE: If you can't attend, a full attendee materials kit is available for just $99.95!

OFFICIAL SPONSORS:

RAD data communications

Network Systems

An Information Packed 2-Day Seminar
Taught by Mark A. Miller

Dates and Locations

MINNEAPOLIS, MN Jan. 18–19 Minneapolis Marriott City Center	**BOSTON, MA** Feb. 28–Mar. 1 Royal Sonesta Hotel
DALLAS, TX Jan. 31–Feb. 1 Omni Richardson	**NEW YORK, NY** Mar. 2–3 Guest Quarters Suites
CHICAGO, IL Feb. 2–3 Sheraton Gateway Suites/O'Hare	**WASHINGTON, DC** Mar. 14–15 Bethesda Ramada
LOS ANGELES, CA Feb. 14–15 Los Angeles Airport Marriott	**ATLANTA, GA** Mar. 16–17 Northeast Atlanta Hilton
SAN FRANCISCO, CA Feb. 16–17 Hyatt Regency San Francisco	**PHILADELPHIA, PA** Mar. 22–23 KormanSuites Hotel

DETROIT, MI
Apr. 4–5
Omni Hotel

Call 800-643-4668 *Register today for the seminar nearest you!*

E-mail your request for information to **seminars@idg.geis.com** *to automatically receive an e-mailed version of our seminar brochure. Please put the word "broadband" in the subject field.*

Dial Our **FAX-BACK** *Information Line at* **800-756-9430** *for a complete seminar outline and registration form. When prompted, request document #80.*

EDITORIAL INSIGHTS

Your five-step program

Is your head spinning as you try to make sense of how your hub and router vendors are going to bring you into the golden age of switching?

Everyone agrees that switching looms large in your future, but it's difficult determining which firms will do the best job of migrating you to a switched environment. They've all got snappy monikers for their switching strategies — for instance, High-Performance Scalable Networking, Synthesis, BaySIS, CiscoFusion — and they all (well, almost all) make sense on paper.

The sad truth is I've spent many hours with the top executives from these firms going over their switching plans, and I'm no closer to predicting a winner with any certainty. But what I've gotten for all this painful thinking is an understanding of the key issues customers should be examining:

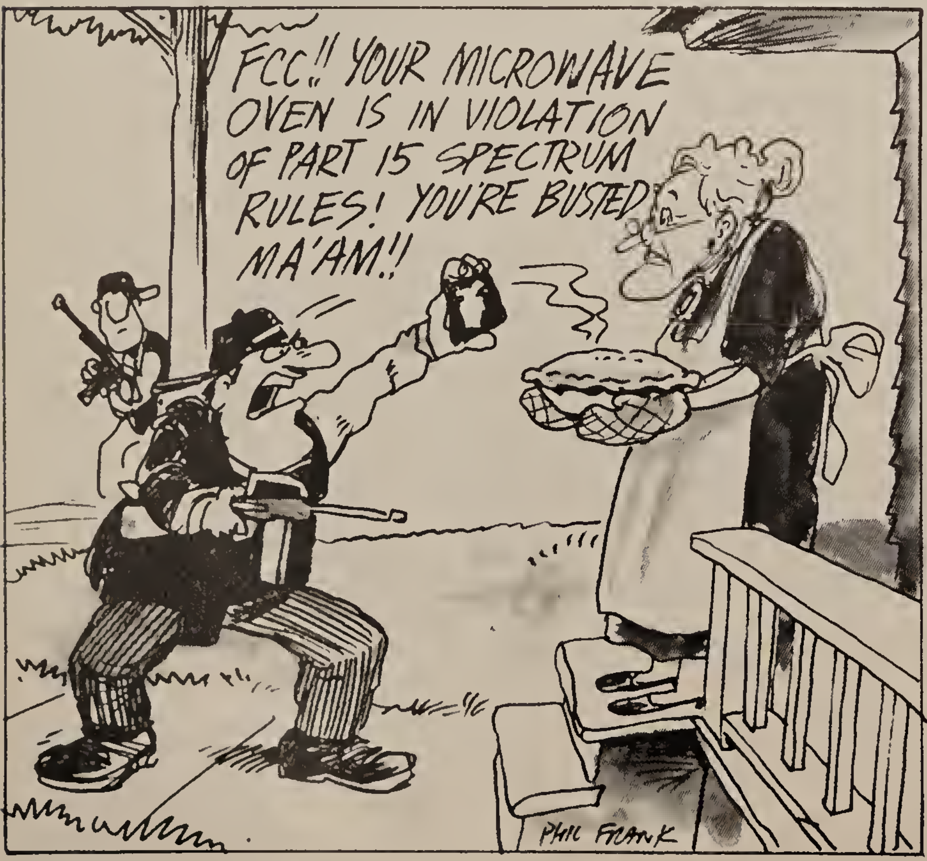
- **Technology.** Here, I lean toward Cisco, with its powerful routing platform and the switching technology it has acquired. Give Bay Networks a close second here for its strong hub, routing and switching components. Caveat: This refers to having the right pieces to work with, integrating them and delivering is another matter.
- **Integration skills.** All these companies face a big job integrating technologies, whether they were developed in-house or acquired. I give the nod to 3Com, which has a great track record of melding diverse tools into pleasing packages. (That's right, 3Com, even though you don't hear much about them in this battle of the strategies.)
- **Network management.** Moving to a mix of switched and shared-medium networks and virtual LANs really complicates the management challenge. That's where Cabletron has an advantage with Spectrum, which is better than rival management offerings, and it's getting better all the time.
- **Distribution.** Even the best solution won't get rolled out to your sites without a focused, zealous sales effort. I lean toward direct sales — it's difficult to sell a vision through resellers — and Cabletron, which has mastered customer handholding. That's a big edge when users have to swallow hard and make the plunge into switching. Dark horse: Keep an eye on 3Com, which has great strength in the reseller channel and a rational switching strategy.
- **Service and support.** This is a corollary to the above. I like direct support, and Cabletron has the horses here. But the good news is that all the vendors are taking steps to improve service.

In assessing the vendor strategies, weigh all of these factors, mixing into the analysis your own experiences with the companies. Most importantly, remember that technology is only part of the picture, even though it tends to dominate the next-generation networks discussion. Having put my stake in the ground, I'd like to know what you think.

⊸ JOHN GALLANT jgallant@world.std.com

TELETOONS

FRANK AND TROISE


FCC!! YOUR MICROWAVE OVEN IS IN VIOLATION OF PART 15 SPECTRUM RULES! YOU'RE BUSTED MA'AM!!
PHIL FRANK

THE BLUE VIEW

by Anura Guruge

DLSw to desktop is a technology in search of a problem

Using Data Link Switching (DLSw) to encapsulate Systems Network Architecture traffic within TCP/IP at its source — personal computers and workstations — rather than at a bridge/router is the latest red-hot trend sweeping across the IBM LAN and WAN internetworking community (Dec. 19, 1994, page 17). However, DLSw to the desktop is a solution that is desperately seeking a problem.

The beguiling notion of restricting SNA to the very periphery of a multiprotocol network was unleashed last November when Cisco Systems, Inc. — the relentless innovator of SNA internetworking facilities — unveiled its Native Client Interface Architecture (NCIA). As it has done in the past with channel-attached bridge/routers, Advanced Peer-to-Peer Internetworking and built-in PU 4-based SNA routing, Cisco has with NCIA again opened up a Pandora's box of issues, stimulated animated debate and polarized opinions regarding the wisdom of restricting SNA to PCs and workstations. Personally, I cannot see the problem that DLSw to the desktop is trying to address when it comes to *LAN-attached* PCs or workstations.

Remember that the issue here is not the merits of encapsulating SNA within TCP/IP to transport it across a multiprotocol backbone, as with DLSw or Cisco's DLSw+. Compared to the de facto alternative, which is bridging the SNA traffic in some form, TCP/IP encapsulation offers significant advantages, including dynamic alternate routing, load balancing and traffic prioritization. The issue here is whether this encapsulation and de-encapsulation should be done by bridge/routers or within PCs. It is not as if DLSw to the desktop eliminates the need for bridge/routers; Cisco was unlikely to advocate such heresy.

DLSw to the desktop does offer some advantages to mobile SNA users who have to dial in to a bridge/router to gain access to a corporate backbone network. With DLSw to the desktop, SNA dial-up users will be able to easily employ Serial Line Internet Protocol (SLIP) or Point-to-Point Protocol, the two de facto standards for remotely accessing bridge/routers.

Users of LAN-attached PCs and workstations do not need such protocols to talk to a bridge/router. They can do so using native media access control (MAC) and Logical Link Control (LLC) protocols. It is also worth noting that DLSw to the desktop doesn't obviate the need for MAC and LLC protocols. DLSw to the desktop just adds more headers — and, consequently, traffic — to the message units traveling between PCs on a LAN and a bridge/router.

Moreover, DLSw to the desktop has the potential to increase costs significantly. DLSw-capable bridge/routers are available from IBM and Proteon, Inc. for less than $2,000. However, the cost of DLSw to the desktop purely in terms of added net administration costs and potential loss of end-user productivity — not to mention the cost of adding TCP/IP software to every PC — could be huge. In most cases, it would be less expensive to buy the most powerful router on the market than incur the hidden, but real, costs of DLSw to the desktop.

Unless Proteon's multicasting extension to DLSw is used, DLSw schemes require that the TCP/IP addresses of all destination bridge/routers be specified. Rather than confining this TCP/IP address administration to just the source bridge/routers, desktop DLSw requires that it be done at each PC and workstation. Even if there is only one destination bridge/router — for example, only one SNA mainframe — this would still require a destination TCP/IP address to be specified at each workstation. Such would also be the case each time the destination address was changed.

If the network has many potential destinations — for instance, multiple dispersed mainframes, AS/400s or APPN networks — multiple destination addresses will have to be specified and maintained at each workstation. This could be a nightmare, particularly if the end users are not very computer- or network-literate. The costs of administering LAN networks are already high. DLSw to the desktop would make it worse.

DLSw to the desktop's potentially negative effect on end-user productivity is also a cause for concern, given that user companies are still trying to boost worker productivity to reflect the investments in desktop automation that they've made to date. Anything that fosters productivity should be encouraged since the proliferation of electronic mail, bulletin boards and the attractions on the information superhighway could further impinge on productivity.

Preemptive multitasking operating systems, which will soon be the norm, will offer an easy and even transparent way to boost productivity. Multitasking systems enable an end user to engage in multiple tasks — for example, an SNA session to mainframe, a file transfer with a local E-mail file server, a large Excel spreadsheet recalculation and a fax transmission — at the same time. Already, Unix, Windows NT and OS/2 Warp support preemptive multitasking. So will Windows 95.

By contrast, performing encapsulation and de-encapsulation in each PC, as required by DLSw to the desktop, uses up valuable PC processor cycles that could be better used to execute other active tasks. Moreover, it isn't as if the whole user community is fortunate enough to have a 486, Pentium or PowerPC-based computer. Cisco and IBM advocate the notion of TCP/IP Offload — that is, letting a 3172 or channel-attached bridge/router perform some of the TCP/IP Layer 2 and 3 processing, rather than using mainframe resources to support TCP/IP. Analogously, one can think of DLSw or DLSw+ on bridge/routers, which is already here and even well established, as providing a TCP/IP Offload function for SNA PC users.

There are a few more related issues, but the ones that I have discussed are the biggest ones that have caused me to question the value of DLSw to the desktop. As a result, I will utter my usual refrain regarding SNA internetworking strategies: Look before you leap. DLSw to the desktop will work, but before you rush out to buy it, consider the issues and determine whether it really will solve any of your problems.

⊸ Guruge is an independent consultant specializing in internetworking and IBM network architectures. He can be reached at (603) 878-1303 or via the Internet at aguruge@mcimail.com.

EVENT MONITOR

by John Morency

Support is the real scalability issue

Network management vendors are making a big deal lately about the massive number of network nodes their products can support. But what most network managers really will need over the next few years are products enabling them to manage their relatively small, but growing networks, without having to significantly increase the size of their support staffs.

Given recent vendor claims regarding the scalability of their management platforms, you'd think every user internetwork consists of tens of thousands of nodes. For example, Tivoli Systems, Inc. states its Tivoli Management Environment can manage as many as 50,000 nodes. And NetLabs, Inc. asserts its NerveCenter Version 2.0 can manage as many as 80,000 nodes when running atop Hewlett-Packard Co.'s HP OpenView.

In reality, the average user internetwork is much smaller than you might think. I estimate that as many as 80% of today's internetworks consist of 10,000 nodes or less — and a healthy share of these are less than 6,000 nodes. Given this, I believe most network managers won't worry about how to manage 50,000-node mega-networks anytime soon. What they worry about is how to maintain high-quality network service while trying to manage a 3,000- to 5,000-node internet that is often growing by 25% each year.

To gain better insight into the support scalability issue, my firm recently undertook a study to determine the relationship between support staff scalability and what we term network complexity inflation. Complexity inflation is conceptually similar to economic inflation. In economic inflation, the number of dollars available to buy goods exceeds the number of goods available. In complexity inflation, the complexity of the network infrastructure exceeds the ability of support personnel to effectively manage it.

Much like economic inflation, complexity inflation is caused by a number of key drivers. In our study, these included the number of network protocols supported, the different types of equipment used, the number of different vendors to be dealt with, and the number of network management applications and platforms.

For each complexity driver, we measured the level of effort required to initially deliver quality support as well as the effort required for the support staff to maintain ongoing technical competency. We then used these results to calculate a complexity inflation percentage. This percentage represents the incremental amount of staff effort needed to support the required changes. Actual complexity inflation results for our sample ranged between 2% and 10%. These results then were compared against staff budget increases to determine if budgeted staff growth was sufficient to handle the increased network complexity.

We found three particular results from this study to offer the best insight into how nets are evolving. First, two of the top complexity drivers, in terms of effort required to master and sustain, were net management applications and platforms. Second, those shops that exhibited higher complexity inflation (from 5% to 10%) generally tended to be in the early stages of deploying an enterprise network management platform, along with a related set of key applications such as trouble ticketing, configuration management, performance analysis, and hub and router management. Third, those shops that experienced complexity inflation in the 5% to 10% range and were also significantly expanding the size of their nets (in terms of desktop connections) tended to have the greatest shortfall in both the size of the support staff and overall service quality.

What do these results mean for those responsible for developing an effective network management strategy for their companies?

Basically, they point out that network management software's ability to scale to tens of thousands of nodes is far less important to many of today's network managers than features that let support staff quickly become proficient with the product. T

his is particularly true for shops where integrated network management platforms and applications are being deployed at the same time significant network growth is occurring.

These results also indicate that products offering a high degree of self-management — either through robust system architectures (such as 3Com Corp.'s recently announced LANplex 2500 switching hub) or via next-generation intelligent agents (such as UB Networks, Inc.'s Access Empower module for its Access/One hub) — are especially beneficial for both reducing network complexity and enhancing a network manager's ability to do more with less.

My advice is to look for either network management products with superior usability, internetworking products with a high degree of self-manageability or a combination of both. By doing so, you will enhance the probability that you still will be around to celebrate the installation of that 50,000th network node.

➾ Morency is a principal with Strategic Networks Consulting, Inc., a Rockland, Mass.-based firm specializing in internetworking. He can be reached at (617) 871-5195 or via MCI Mail at jmorency.

IN-BOX

No comparison

Your article "Mainframe sales rise, but has this rebound got legs?" (Dec. 12, 1994, page 1) contains a sentence that says: "By comparison [to most mainframes, which cost $30,000 to $35,000/MIPS], IDC says a 90-MHz Pentium-based IBM PC 730 costs $2,716 and can process 150 MIPS, equating to $18/MIPS — which is a mere difference of $29,982/MIPS."

Please correct me if I'm wrong, but I find this statement highly questionable.

Most microprocessors use several cycles to execute a single instruction (fetch, decode and execute).

With Borland International, Inc.'s Turbo Assembler, for example, the "Quick Reference" manual for the product often shows instructions taking a fraction of a clock cycle to execute.

But if you read the assumptions made in the beginning of the manual, it says, "The clock count calculations make the following assumptions: The instruction has been prefetched and decoded and is ready for execution; bus cycles do not require wait states; there are no local bus HOLD requests delaying processor access to the bus; no exceptions are detected during instruction execution; [and] memory operands are aligned."

The point I'm trying to make is that the comparison of IBM mainframe's MIPS and the 80X86 microprocessor's MIPS may be invalid because of hidden assumptions.

If you are more realistic, at least three clock cycles are needed, (fetch, decode and execute).

With this minimum assumption, the MIPS are recalculated as follows:

90M cycle/sec X 1 instruction/3 cycles = 30 MIPS

This would equate to a cost of $2,716/30 MIPS = $90.5/MIPS.

This $90.5/MIPS is still pretty small compared to $30,000/MIPS. However, anytime a vendor claims that its PC will execute more instructions than it has hertz, then an alarm should go off signaling that maybe the vendor isn't telling the whole story.

By quoting such exaggerated claims in your article, you give the appearance of an antimainframe bias that seriously detracts from an otherwise well-written article and your publication's credibility.

Michael NeSmith
Computer systems analyst
National Defense University
Washington, D.C.

In defense of Fibre Channel

On behalf of the Fibre Channel Association, I would like to clarify some misconceptions regarding Fibre Channel technology presented in Dan Minoli's column "Fibre Channel Standard is no competition for ATM" (Dec. 19, 1994, page 18).

Fibre Channel has never been envisioned as a telecommunications-like solution for the wide area. It is a cost-effective, high-speed technology for transporting large volumes of data in the local area, where link distances do not exceed 10 km. Fibre Channel's ability to transfer data at speeds of up to 1G bit/sec, securely and bidirectionally, make it an ideal high-performance communications option for distributed computing environments. Business, government and educational institutions are using

See In-box, *page* 54

NETWORK WORLD

Editor in Chief
John Gallant
Editor
John Dix

NEWS
News Editor
Paul Desmond
Associate News Editor
Bob Brown
Special Assignments Editor
Beth Schultz
Phone: (312) 283-0213; Fax: (312) 283-0214
ENTERPRISE INTERNETS
Michael Cooney - Senior Editor
Phone: (703) 830-8138; Fax: (703) 830-7963
Jim Duffy - Senior Editor
Phone: (508) 820-7525; Fax: (508) 820-3467
Ellen Messmer - Sr. Washington Correspondent
Phone: (202) 879-6752; Fax: (202) 347-2365
Michael Csenger - Senior Writer
Phone: (201) 587-7768; Fax: (201) 587-7769
LOCAL NETWORKS
Peggy Watt - Senior Editor
Phone: (415) 903-9519; Fax: (415) 968-3459
Kevin Fogarty - Senior Writer
Phone: (508) 820-7456; Fax: (508) 820-3467
Jodi Cohen - Staff Writer
Phone: (508) 820-7449: Fax: (508) 820-3467
Margaret Dornbusch - Staff Writer
Phone: (512) 442-0552; Fax: (512) 442-0857
GLOBAL SERVICES
Joanie Wexler - Senior Editor, RAF Coordinator
Phone: (415) 712-8200; Fax: (415) 712-8333
Tim Greene - Senior Writer
Phone: (508) 820-7422; Fax: (508) 820-3467
David Rohde - Sr. Washington Correspondent
Phone: (202) 879-6758; Fax: (202) 347-2365
CLIENT/SERVER APPLICATIONS
Barb Cole - Senior Writer
Phone: (619) 484-4896; Fax: (619) 484-0069
Adam Gaffin - Senior Writer
Phone: (508) 820-7433; Fax:(508) 820-3467

Managing Editor
Michelle Psyhogeos
ART
Rob Stave - Art Director
Susan Champeny - Design Editor
Susan Slater - Design Editor
Terri Mitchell - Associate Design Editor
COPY DESK
Karen Moltenbrey - Chief Copy Editor
Chris Burt - Copy Editor
Amy Koulouris - Copy Editor
Laura Mascharka - Copy Editor

FEATURES
Features Editor
Charles Bruno
(407) 897-4486; Fax: (407) 897-5481
Jim Brown - Managing Editor
Phone: (508) 820-7408; Fax: (508) 820-1103
Lee Schlesinger - Test/Reviews Editor
Phone: (508) 820-7416
Susan Collins - Associate Features Editor
Phone: (508) 820-7413; Fax: (508) 820-1103
Dana Thorat - Associate Features Editor
Phone: (508) 820-7451; Fax: (508) 820-1103
Cheri Paquet - Assistant Features Editor
Phone: (508) 820-7489; Fax: (508) 820-1103
Contributing Editors
Daniel Briere, David J. Buerger,
Mark Gibbs, James Kobielus,
Mark Miller, Alan Pearce
Buyer's Guide Contributors
Mary Petrosky, **The Burton Group;** Tony Croes,
Linda Musthaler, Josh Penrod, **Currid & Co.;**
Mark Miller, **DigiNet Corp.;** James Kobielus, **Dyn
Network Management, Inc.;** Mike Marburg,
Meta Group Global Network Strategies; Joel
Snyder, **Opus One;** Daniel Blum, Gary Rowe,
Rapport Communication; Daniel Briere,
Christopher Finn, Christine Heckart, Mark
Langner, **TeleChoice, Inc.**
Test Alliance Partners
Scott Bradner, Harvard University's Network
Device Test Lab; Todd Coopee, Trinity College;
Mark Gibbs, Gibbs & Co.; Steven Goldberg,
Coopers & Lybrand; Interdisciplinary
Telecommunications Program, University of
Colorado at Boulder; National Computer
Security Association; TeleChoice, Inc.
Teletoons
Phil Frank, Joe Troise

Assistant to the Editor
Cheryl Crivello
Editorial Assistants
Pauline Chouinard
Glenna Fasold
Kathy Scott

Colin Ungaro - **President/Publisher**
Mary Fanning - **V.P. Finance & Operations**
Nanci Farquharson - **Office Service Manager**
Mary Kaye Newton - **Administrative Assistant**

Board of Directors
Colin Ungaro, Pat McGovern,
Bob Metcalfe, Joe Levy, Kelly Conlin

Network World
161 Worcester Road
Framingham, MA 01701
Phone: (508) 875-6400; Fax: (508) 820-3467
MCI Mail - 390-4868
Internet: network@world.std.com

For more details on how to reach us, see page 83.

Network World Advertising
Colin Ungaro, President/Publisher
Mary Kaye Newton, Admin. Assistant to the President
Eleni Brisbois, Sales Assistant
161 Worcester Road, Framingham, MA 01701
(508) 875-6400/FAX: (508) 879-3167

Sales Offices
NEW YORK/N. NEW JERSEY
Carol Lasker, Eastern Regional Sales Manager
Tom Socvyn, Manager, Demographic Editions
Dail Reid, Sales Assistant
365 W. Passaic St., Rochelle Park, NJ 07662
(201) 587-0090/FAX: (201) 712-9786

BOSTON
Donna Pomponi, Senior District Manager, N.E. Region
Nancy Robinson, District Manager
Jolene Springfield, Sales Assistant
161 Worcester Road, Framingham, MA 01701
(508) 875-6400/FAX: (508) 651-1853

S. NEW JERSEY/PHILADELPHIA/D.C.
Jacqui DiBianca, District Manager
Rick Groves, District Manager
(610) 341-6025/FAX: (610) 254-8958
Patricia DeBiase, Sales Assistant
(610) 971-0808/FAX: (610) 254-8958
351 E. Conestoga Road, Wayne, PA 19087

CHICAGO
Dan Gentile, Midwest Regional Sales Manager
Anna Gabriel, Sales Assistant
1011 E. Touhy Avenue, Suite 550, Des Plaines, IL 60018
(708) 297-8855/FAX: (708) 827-9159

SAN FRANCISCO
Lisa Hall, District Manager
Sandra Kupiec, District Manager
Paula Connor, District Manager
Beverly Davis, Sales Assistant
Carol Stiglic, Sales Assistant
894 Ross Drive, Suite 200, Sunnyvale, CA 94086
(408) 541-8630/FAX: (408) 541-8640

ATLANTA
Don Seay, District Manager
Terry Sanders-Prentice, Sales Assistant
Lakeside Commons, 990 Hammond Drive,
Suite 600, Atlanta, GA 30328
(404) 394-7509/FAX: (404) 255-5123

LOS ANGELES
Amy C. Bartulis, District Manager
Julie Haws, Sales Representative
Tracy Pennell, Sales Assistant
2171 Campus Drive, Suite 100, Irvine, CA 92715
(714) 250-3006/FAX: (714) 250-4881

DIRECT RESPONSE ADVERTISING
Response Card Decks/ActionCenter/Marketplace
Joan Bayon Pinsky, Sales Director
Clare O'Brien, District Manager
Caterina Campisano, Account Executive
Chris Gibney, Sales Assistant
Sharon Chin, Sales Assistant
(508) 875-6400/FAX: (508) 628-3976

RECRUITMENT ADVERTISING
Pam Valentinas, Director of Recruitment Advertising
Denise Baer, Sales Assistant

ADVERTISING OPERATIONS
Karen Wallace, Manager of Advertising Operations
Cathy Sampson, Sr. Advertising Account Coordinator
Ann Lewis, Advertising Account Coordinator
Deborah McKenna, Direct Response Ad Coordinator

MARKETING
Virginia Lehr, Director of Marketing
Joanne Wittren, Marketing Services Manager
Kristin Wattu, Marketing Specialist/Promotion
Lynda Fitzpatrick, Market Research Analyst

SPECIAL PROJECTS
William Reinstein, Vice President of Business Development
Debra Mahler, Product Specialist
Christie Sears, Operations Coordinator
Alayne Arntz, Operations Assistant
FAX: (508) 820-1283

RESEARCH
Ann MacKay, Research Director

CIRCULATION
Deborah Winders, Vice President Circulation
Richard Priante, Director of Circulation
Bobbie Cruse, Assistant Circulation Director
Mary McIntire, Circulation Assistant

PRODUCTION SERVICES
Jeff Pennett, Vice President Network/Production Services
Ann Finn, Production Director
Greg Morgan, Production Coordinator
FAX: (508) 875-3090

REPRINTS
Donna Kirkey, Reprint Manager/Graphic Designer

LIST RENTAL SERVICES
Kelly Martin, List Rental Sales
P.O. Box 9151, Framingham, MA 01701-9151
(800) 343-6474/(508) 370-0826
FAX: (508) 370-0020

NETWORK INFORMATION SERVICES
Jeff Pennett, Vice President Network/Production Services
Jack McDonough, Network Manager
Eric Powers, Network IS Support Specialist
Anne Nickinello, Digital Imaging Manager

DISTRIBUTION
Bob Wescott, Distribution Manager
(508) 879-0700

ADMINISTRATION
Mary Fanning, Vice President Finance and Operations
Nanci Farquharson, Office Service Manager
Paul Mercer, Billing Manager

IDG
Patrick J. McGovern, Board Chairman
Walter Boyd, President
William P. Murphy, Vice President Finance

Network World is a publication of IDG, the world's largest publisher of computer-related information and the leading global provider of information services on information technology. IDG publishes over 200 computer publications in 63 countries. Forty million people read one or more IDG publications each month. *Network World* contributes to the IDG News Service, offering the latest on domestic and international computer news.

Help desk

Continued from page 2

wiring simple and easy to work with when you are having host-related problems.

Our company has Lotus Development Corp.'s cc:Mail and Lotus Notes. We also have a cc:Mail Link to SMTP to connect to the Internet. I understand that cc:Mail can download Internet news because it has an internal bulletin board.

However, I don't know how to set it up so we can download Internet news through our cc:Mail Link to SMTP software. How do we do it?

Ruiyan Jiang, Edison, N.J.

David Johanson, a technical analyst in the Dallas office of Paranet, Inc., a network services provider based in Houston, says:

Lotus' cc:Mail Link to SMTP product does not have any direct news reading capabilities. The way most newsreaders function is by accessing an interactive Network News Transfer Protocol (NNTP) service that runs on a local host receiving the Usenet postings over a period of time. The newsreader interacts with the NNTP host to receive or post messages. However, this does not preclude the cc:Mail Link to SMTP from receiving Usenet postings, such as Internet news.

The Link to SMTP can be configured to receive messages that are mailed like a standard electronic mail message from a news server. The news server can be configured to mail messages from selected newsgroups to an E-mail address whenever a new message is posted. If the news server gets a message posted in the comp.binaries.ibm usenet group, then it can be configured to mail that message to an E-mail address of compbibm@yourhost.yourdomain.com.

A translation file in cc:Mail Link to SMTP, called SMTP.ADR, would contain an entry of: #Computer-Binaries-IBM = compbibm.

When the news server mails the message to the compbibm@host.domain.com E-mail address, the cc: Mail Link to SMTP gateway will receive the message and post it to the Computer-Binaries-IBM bulletin board on the cc:Mail post office.

One note of caution: Make sure you don't have a mailing list with the same name as the bulletin board receiving the Usenet messages.

The shortcomings of this configuration are that you receive only messages mailed from the news server.

You cannot reply to the messages and post your replies back to the Usenet group. In short, cc:Mail Link to SMTP was not originally designed to provide any news reading or posting capabilities with an NNTP server, but it can be configured to receive mail with a specified address and post it to a bulletin board on a cc:Mail post office. ◻

In-box

Continued from page 53

Fibre Channel products today in critical applications, such as mass storage and clustering.

Far from being a simple point-to-point technology, Fibre Channel is fundamentally defined as a switched technology that can be scaled to meet the requirements of almost any campus-like environment. It also has definitions for both point-to-point channel-like connectivity and a shared-bandwidth loop. In addition to being topology-independent, Fibre Channel is also protocol-independent since it can carry both channel commands, such as Small Computer System Interface, and network commands, such as TCP/IP, over the same physical infrastructure simultaneously.

Currently, 266M bit/sec Fibre Channel switches and adapters are available from multiple vendors, and next year, full gigabit speed switches and switched attached storage devices, such as disk arrays, will be available from several vendors. In addition, disk drives that use the Fibre Channel arbitrated loop as an interface will become generally available in the second quarter of this year.

Fibre Channel is a hybrid that incorporates the best attributes of both network and channel technologies. It is hardly a product of just supercomputer and mainframe vendors.

Fibre Channel and ATM each were designed with fundamentally different intents. ATM has its roots in the telecommunications industry, while Fibre Channel emerged out of the computer industry. While there is some overlap of capability between these two technologies, specifically in the LAN environment, each can do something the other cannot. With ATM, it is the ability to span the wide area. With Fibre Channel, it is the ability to attach CPU and peripheral devices directly to a very high-speed network infrastructure. Therefore, Fibre Channel and ATM should be viewed as complementary technologies.

Jeff Silva
Chairman, Board of Directors
Fibre Channel Association
Austin, Texas

Minoli's response: I agree with the Fibre Channel Association's proper positioning of Fibre Channel as a technology that is complementary to ATM. However, some Fibre Channel proponents have presented it as an alternative to ATM for the enterprise and workgroup environment; here, I disagree.

I think that Fiber Channel is not ideal at the workgroup LAN level since it does not support Category 5 cabling between the user equipment and the wiring closet. In contrast, ATM and 100M bit/sec Ethernet have made the use of existing enterprise cable, such as Category 5, a design goal, so users can avoid the considerable expense of rewiring the corporation.

Users prefer a technology that is the same at the LAN and WAN levels. ATM's purpose is to facilitate that — Fibre Channel can't. It is not a WAN technology. The use of a single technology for workgroup and enterprise applications makes the bottom line less expensive by keeping the amount of distinct equipment down, eliminating protocol conversion and enabling firms to retain the same staff to manage both the local and remote nets, which keeps staffing to a minimum.

Also, organizations want to be able to hire technical support and net operations people at a reasonable salary. Unfortunately, there isn't a pool of technicians out there with many years of experience in the Fibre Channel field. At least with ATM, users can draw personnel from the carriers.

Technology developers have a natural disposition to make claims related to the postulated success of their own specialty. Surely, proponents of technologies such as IEEE 802.6, IEEE 802.9, FDDI II and data over ISDN believed their technologies would quickly enter the mainstream, but history proved them wrong. Now proponents of technologies such as 100Base-T, 100VG-AnyLAN, switched FDDI, full-duplex LANs, 25M to 155M bit/sec ATM LANs and Fibre Channel all claim their candidate will enter the corporation in a big way. Clearly, some of these technologies won't make it in the mainstream.

NETWORK WORLD DIRECTORY OF SERVICES

NetDraw Clip Art for Building Networks™

Diagram your network infrastructure quickly, effectively and professionally with *Network World's* NetDraw v3.0 and NetDraw Plus v2.0 software. At your fingertips, you will find over 1,100 full color, vendor specific network images in the areas of LAN's, WAN's, internetworking, personal computing and much more! New product features in NetDraw Plus v2.0 include "Smartdrawings" with built-in connect points, "Drag and Drop" drawing, multi-layered hierarchical diagramming and customizable image libraries.

Call 800-643-4668 to order your copy today!
Fax-Back Document Code #10*.

NetText™
An on-line library of *Network World* articles

With a subscription to NetText™ Online you can search three full years of every article printed in *Network World* and *Computerworld*! The answers to all your network questions are just a local phone call away. Our easy to use communications software for NetText™ is available for MAC, DOS or Windows platforms.

Call 800-643-4668 to subscribe today!
Fax-Back Document Code #25*

NETWORK WORLD Satellite Seminars

To serve the growing demand for information and education on the emerging Electronic Marketplace, *Network World's* Satellite Seminar, *Capitalizing on the Internet*, is a three-part, live, satellite-delivered seminar series which covers the Internet as an emerging force in business. *Network World Satellite Seminars* provides you with an exciting, cost-effective and convenient way to train your entire staff.

Call 800-643-4668 to license today!
Fax-Back Document Code #70.

REPRINTS

Publicize your press coverage in *Network World* by ordering reprints of your editorial mentions. Reprints make great marketing materials and are available in quantities of 500-10,000.

To order, contact Reprint Services at
612-582-3800 or 315 5th Ave. N.W.,
St. Paul, MN 55112.

NETWORK WORLD TECHNICAL SEMINARS

Network World Technical Seminars are one and two-day, intensive seminars in cities nationwide covering the latest networking technologies. All of our seminars are also available for customized on-site training. Our current seminars include: *Analyzing Broadband Networks* and *Managing the Migration to Client/Server Networks*.

Call 800-643-4668 to register today!
Fax-Back Document Code #80* & #40*.

Interactive Product Demos On Network World's Bulletin Board
Dial (508) 620-1160 (300 to 2400 bps 8N1); (508) 620-1178 (9600 bps)
NetACCESS

NetACCESS

Use NetACCESS to download demonstration copies of products offered by *Network World* advertisers for a trial run. To sample the variety of demos, use any personal computer to reach our BBS at 508-620-1178. (8N1, up to 9600 bps)

***Our instant fax-back service delivers information on many of the above products. Dial 800-756-9430 from your touch tone phone and use the appropriate document code to have information faxed right back to your fax machine!**

If your company is tied up by multiple access lines, discover the freedom of frame relay from us.

Now you can untangle your communications with the simplicity of single line access that interconnects all of your LANs. A simplified system that lets you tap into one of your most valuable resources–your own information. Information that until now you haven't been able to affordably share. And as you grow, each of your new locations can be networked instantly. Let information flow freely to where it's supposed to. Call Sprint/United Telephone and Sprint/Centel and ask about frame relay. It's the fast, flexible and reliable way to easier and better wide area communications. **800-488-8214.**

Sprint
United Telephone-Florida
Centel-Florida

Be there now

"TRACY, BETTER GET DOWN TO THE NEW YORK HILTON FAST. THE KINGPINS OF REMOTE, WIRELESS AND MOBILE COMPUTING ARE ABOUT TO SPILL THE BEANS!"
"DON'T WORRY, CHIEF. I'M ON MY WAY. AND IF SMART BUSINESS EXECS AND IT PROS DON'T WANT TO GET BEHIND THE EIGHT BALL, THEY'LL BE THERE TOO."
LOCHER ® ©TMS

Announcing Network World Unplugged
April 11-13, 1995, New York City

Do you want to learn how remote and wireless computing can help increase productivity? Or find out how to integrate new unplugged technologies with your existing ones?

Exhibitors List
(As of December 21, 1994)
3COM • Aironet Wireless Communications Inc. • ARDIS • AT&T • Bay Networks • Cabletron Systems • Cayman Systems • Cellular One • Cisco Systems Inc. • *Communications News* • CompuServe • *Crain's New York Business* • Cylink • Datadirect & Cabledirect • Datapro Information Services Group • DCA • Delta Computec Inc. • Digital Equipment Corporation • IBM • Information Management Associates • LCI • LXE • MCI • McLaughlin & Associates • Metricom • Microwave Bypass Systems • MobileWare Corp. • Motorola Wireless Data Group • National Portable Computing Professional Assoc. • NEC Technologies Inc. • *Network World* • Network Professional Assoc. (NPA) • Norand Corporation • Notable Technologies • NovaLink Technologies, Inc. • NYNEX Mobile Communications • Pacific Communication Sciences Inc. • *Pen Computing Magazine* • Persoft Inc. • Proxim Inc. • PSION Inc. • RAM Mobile Data • *Retail Info Systems News* • Rockwell Networking Systems • Simware Inc. • Solectek Corporation • Sprint • Stampede Technologies Inc. • Steinbrecher Corporation • Symbol Technologies • Symplex • TechSmith Corporation • Telepartner International • Track On • ViaSat Technology Corporation • XcelleNet • Xircom

Then hold onto your wrist radio. Because Network World Unplugged℠—the first and only show to focus on the real-world challenges of remote computing and wireless networking—is coming to the New York Hilton, April 11-13, 1995.

Witness the latest in unplugged hardware, software and solutions firsthand. Hear from industry leaders like Mel Trudeau, CIO, Official Airline Guides. And walk away with practical ideas, insights and information on how to provide unplugged users with anywhere, anytime access to the corporate network.

Don't miss Network World Unplugged's in-depth tutorials and conference sessions. The Application Solutions Track covers topics ranging from remote LAN and database access to getting mobile applications on the air. And the Integrators Forum features sample RFPs for deploying and supporting a mobile workforce and improving productivity in retail, distribution, finance and insurance.

NetworkWorld Unplugged is sponsored by *Forbes ASAP*—the technology supplement to *Forbes* magazine. And it's co-produced by *Network World*, IDG's newsweekly shaping the future of network computing in the enterprise, and IDG World Expo, the leading producer of professional conferences, expositions and seminars for the information technology industry. So you're assured of a first-class event.

ZAP!

Register for Network World Unplugged today. It would be a crime to miss it.

NETWORK WORLD UNPLUGGED
The Anywhere Anytime Computing Conference And Exposition

Dick Tracy ® & ©, 1994, Tribune Media Services, Inc.
All Rights Reserved. Unplugged is a service mark of IDG World Expo.

NETWORK WORLD UNPLUGGED APRIL 11-13, 1995

Sign up for your FREE Exhibits Badge. Or save up to $200 on selected conference packages.
Check one:
☐ Please send me information about registering for my FREE Exhibits Badge.
☐ Please send me information about registering for the conference program.
☐ Reserve—without obligation—my discount of up to $200 off selected conference packages.

Complete and return this form to: Network World Unplugged, c/o IDG World Expo, 111 Speen Street, P.O. Box 9107, Framingham, MA 01701-9107. Or call us toll-free at 800-225-4698 in the U.S., or 508-879-6700. For fastest service, fax us at 508-872-8237. Or contact us via e-mail: unplugged@idgwec.com

NAME
TITLE
ORGANIZATION
STREET
CITY STATE/PROVINCE
ZIP/POSTAL CODE COUNTRY
TELEPHONE FAX:
INTERNET/E-MAIL NW4

SPONSORED BY: Forbes ASAP PRODUCED BY: IDG WORLD EXPO NETWORK WORLD

Fast storage fit for a server

Micropolis' Raidion array and networks are a Valentine's Day match.

By Dale Hibner

Micropolis Corp. has added a thoroughbred to its stable of RAID offerings for LAN environments — a new, speedy, easily expandable device that our review found offers effortless LAN data recovery.

At the heart of the new Micropolis Raidion LTX is the Gandiva controller, which provides a speed boost for the drive array. The Gandiva is a Small Computer System Interface (SCSI)-2 controller that provides data flow at 20M byte/sec.

The LTX is a desktop device that comes with four or five modules. The Gandiva controller is the base module for each stack, so each unit can be configured with a maximum of three or four disks.

Additional drive modules in individual or multiple drive increments can be added. Whether the configuration has a single or multiple stacks, users have the ability to address the entire set as a single logical unit.

The model the vendor sent us for this review was a four-disk unit that we configured as one array. The utilities for configuration do not allow any array of less than three drives.

The LTX uses one 20M byte/sec Fast Wide SCSI-2 bus as its external interface to a personal computer or server running OS/2, Windows NT, Unix, NetWare or the Macintosh operating system.

The internal bus architecture of the LTX, based on the Gandiva controller, is four independent 10M byte/sec Fast SCSI-2 channels. The controller uses a 32-bit Reduced Instruction Set Computing controller and proprietary application-specific integrated circuit hardware.

Since each 10M byte/sec SCSI channel can support as many as seven drives, an LTX can include as many as 28 drives configured as a single array or multiple arrays. For more than seven drives, the LTX requires the user to configure the system into additional stacks.

One helpful feature the LTX supports is the ability to configure one of the drives in the stack as an on-line spare. This option is only available if the stack has at least four drives. All LTX drives are hot-swappable, and each drive module has its own fan and power supply.

Like the Raidion LT, the LTX uses Redundant Array of Inexpensive Disks Level 0, 1 and 5 storage procedures, depending on the setup (see story, page 58). RAID Level 3 is not available. With a multiple array configuration, a single Raidion stack can provide all three RAID levels simultaneously. By using the different RAID levels, industrious administrators can provide optimum speed for different applications.

CONFIGURING THE SYSTEM

The LTX uses logical unit numbers to manage the arrays, and each array appears as a contiguous drive. The LTX allows as many as eight arrays, and each array can be set up for a different RAID level.

The Raidion LTX offers three methods for entering the initial configuration. The Gandiva controller unit has a built-in LCD panel that can be used to access the utilities, or a VT-100 terminal can be attached via a serial cable to a nine-pin RS-232 port on the back of the Gandiva module. Micropolis also supplies utility software for NetWare, OS/2, Macintosh and other target systems. The three methods appeared to perform nearly equivalent functions.

The LCD panel has a two-line display and four buttons for controlling all the setup functions. Its one limit is that it has no alphanumeric input capability for changing the default names of ARRAY0 or ARRAY1. In office lighting, we occasionally had to maneuver to avoid glare and see the display. When using the display, the current location in the menu scheme is not obvious, and the flowchart provided in the documentation is useful but not complete.

The VT-100 connection is easy to set up. It gives more feedback on the activity under way than does the LCD panel and allows the creation of more descriptive names for an array of disks. However, the screens still provide only limited information. The location in the menu scheme is better than with the LCD display but still obscure.

By far, the best alternative for configuration and changes is the RAIDware utility programs. Users must know on which operating system the Raidion LTX will be used in order to request the proper utility from the vendor. We did our testing in the NetWare environment but also tried out the Macintosh utilities. The NetWare utility screens are displayed as cascaded windows, while the Macintosh utilities are descriptive icons and easy to follow. In both cases, the user is not likely to get lost in the setup routines.

The stripe size, which is the amount of data written to each disk in the array at one time, is pretuned based on the type of use the administrator specifies when ordering the array. For example, for on-line transaction processing applications, the stripe size is small (4 to 8 bits) due to the large number of small transactions and the demand for high speed.

For applications such as multimedia, the stripe size is large (128 bits) to support movement of larger files. For classic office automation applications, a mid-range stripe size is appropriate. For most first-time users, the default configuration is probably adequate. We started with 32-bit stripes.

If the configuration of any single array has to be changed, all the information stored on that array is lost. Since the data on an array is stored based on RAID level and number of drives, this is not unrealistic.

The changes that require the reformatting of an array are: selecting a different RAID level, changing the stripe size and changing one array into more than one. Because of the potential information loss, Micropolis recommends reserving one or more of the four internal SCSI channels for future growth. That way, administrators can create a new array on one of the reserved channels without affecting the other arrays. The configuration took about 35 minutes for our three drives and an on-line spare.

Users can reconstruct lost data in a RAID Level 1 or 5 array. The LTX performs reconstruction on the fly. That is, if a drive is lost, the data under retrieval is regenerated. Under typical conditions, the recon-

Continued on page 58

HOW WE *did it*

We tested the Raidion LTX array on two different NetWare 3.11 systems. One server was a 486/DX2 66-MHz EISA-based server with an Adaptec AHA-2740W SCSI controller; the other was a 486/DX2 50-MHz ISA-based server with an AHA-1540 controller. Both were on a 10Base-T network.

We ran multimedia and office automation applications with four to 10 users to stress the array's ability to serve clients. We also disconnected one of the drives in the array to simulate a drive failure and replaced it to test the array's ability to handle hardware errors.

NET *Result*

Product:

Raidion LTX 4-module stack with 12G bytes of storage

Pros:

- Works with any SCSI system.
- Good system utility software.
- Excellent transfer speed.

Con:

- Performance during recovery is average.

Vendor:

Micropolis
21211 Nordhoff St.
Chatsworth, Calif. 91311
(818) 709-3300

Price:

$19,499; additional 4.3G-byte modules cost $3,950 each.

Continued from page 57

struction of a drive is a manual operation performed after the faulty drive is replaced. In larger systems, an on-line spare drive permits automatic reconstruction of a faulty drive from a RAID Level 1 or 5 array. This is an important feature for organizations operating 24 hours a day and requiring minimal system support.

The Raidion LTX is as quick as the 20M byte/sec interface led us to believe. During this review, we could not stress the LTX. The closest we got was when we used four multimedia stations to read and write motion JPEG files. There were slight delays, but we were able to attribute them to network traffic and not directly to the LTX. The LTX was faster than the networked systems that were connected to it. The only noticeable slowdown was during reconstruction of lost data, but that is not unusual.

We tested the hot-swap feature by removing a drive and replacing it with an unused drive. The system slowed while the replacement drive came up. The same slowdown occurred with an on-line spare when we removed a drive, simulating a fault. In an off-line state, the recovery took about 30 to 45 minutes. When we did recovery with users on the system, the process took 90 to 130 minutes.

The LTX proved to be reliable. No unexpected errors occurred during the 60 days of our evaluation.

The documentation for the Raidion LTX is distributed in four or five small volumes. Volume 1 is titled *Introduction and General Information.* It is possible to install an LTX using just this volume. Volume 2, *Hardware Installation and Configuration,* provides the details about the internal cabling, adding a drive, removing covers and the conversion of an LT series to LTX. Volume 3 provides the details of the utilities that are required for custom configurations. The menu flowchart is an appendix in this volume. Volume 4 contains the error messages. Fortunately, we never had to use this. The optional Volume 5 is for the RAIDware Utilities.

The documentation is well written and complete. Micropolis uses Cautions and Notes to alert readers where an action can cause the loss of data or where an action may not work.

The Raidion LTX warrants an overall rating of excellent. The architecture of the Gandiva controller provides the speed LANs require. The expandability and versatility of multiple arrays on a single platform tell network administrators that the LTX models merit serious consideration. ◼

RAID levels and striping

The concept behind Redundant Array on Inexpensive Disks (RAID) is simple. A single housing contains multiple disks that operate as a single unit. RAID can add significant storage capability for a moderate cost.

RAID arrays write data to multiple disks in units called stripes. Striping places only a small portion of any datastream in one location, then jumps to the next physical drive. How fast data is stored and recalled is determined by the stripe size and the location of the parity.

Data can be written to this array in several ways. In RAID Level 0, the data is striped across drives without any parity bits for error checking. This does not provide any capability for recovery but does yield maximum transfer rates.

RAID Level 1 is disk mirroring. Data is written to multiple disks simultaneously. This provides complete redundancy, but the trade-off is the loss of disk space for the complete second copy.

RAID Level 3 stripes data one byte at a time across multiple drives, with parity stored on an extra drive. The speed is good; but for large files, a small data stripe size slows the transfer.

RAID Level 5 stripes sectors of data across the multiple drives with the parity interleaved. The flexibility of RAID 5 is the key to optimizing for a specific application.

NETWORK WORLD TEST alliance

The alliance is a cooperative of users, consultants, educators and integrators that applies its technical and business skills to analyze and compare strategic network products. A list of alliance partners can be found on page 53.

Hibner is director of the Applied Research Institute at the Center for Information and Communication Sciences at Ball State University in Muncie, Ind. He can be reached via E-mail at 00dvhibner@bsuvc.bsu.edu.

INTENSE.

Effective operation of your enterprise network is mission critical. Effective documentation about your network is equally mission critical. NetDraw® and NetDraw Plus will help you diagram and document your network infrastructure quickly, effectively and professionally. In fact, NetDraw makes your diagrams intense.

NetDraw Plus v2.0 integrates a powerful, comprehensive library of over 1,100 highly detailed networking images into a robust Windows™ drawing application.

Drag and Drop the images you need right from the on-screen templates onto your drawing. In full color and richly detailed, NetDraw will help you prepare professional diagrams and presentations. Choose from hundreds of vendor-specific images or from hundreds more general network images and symbols. We even include complete map libraries to diagram your network geographically. Over 1,100 total images!

SmartDrawings™ make the difference. All NetDraw images have intelligence built in. Preset line connect points, text handling and image sizing properties make drawing your network a snap. And since NetDraw remembers how your component images are connected, you can move them around without redrawing a single line! You can also easily customize all image properties to your own needs and specifications.

Multi-Level diagrams and topologies are no problem with NetDraw Plus. Define any image or symbol to link to any other NetDraw Plus diagram. And, NetDraw Plus supports Object Linking and Embedding so you can link your NetDraw diagrams to documents in other Windows applications.

Priced at just $199.95, NetDraw Plus does more than just make your diagrams look good, it makes them intense.

NetDraw

If you already have a Windows drawing application or if you work on a Macintosh, you too can have the power of NetDraw. The complete 1,100 image NetDraw v3.0 clip art library is available separate from our NetDraw Plus application package. NetDraw for Macintosh comes in both EPS and AI formats and NetDraw for Windows comes in Windows Metafile format. Either way, NetDraw images are a breeze to import into almost all applications.

Available now for just $129.95, the NetDraw clip art library provides you with the most comprehensive, highest quality collection of network images and symbols available.

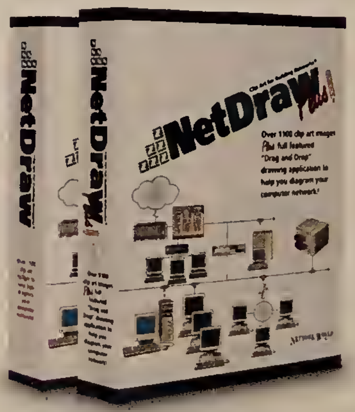
Order your copy today!

☎ **800-643-4668**
OR (508) 820-7493

Dial our **Fax-Back** information line at 800-756-9430 for complete product information and an order form! (When prompted, request document #10)

E-mail your request for complete information to netdraw@idg.geis.com.

NETWORK WORLD


NetDraw
NetDraw Plus
Over 1100 clip art images
Plus full featured "Drag and Drop" drawing application to help you diagram your computer network!

IDG
The World of Information Technology

Network World, Inc., 161 Worcester Road, Framingham, MA 01701-9172. NetDraw® is a registered trademark of Network World, Inc. SmartDrawings™ is a registered trademark of SmartDraw Software, Inc. All other brand or product names are trademarks or registered trademarks of their respective holders.

Tim Berners-Lee spins a complex, yet simple, Web

By Paula Jacobs

It hardly seems right that the World-Wide Web was created in a physics lab. But it was a perfect setting for Tim Berners-Lee, developer of the Web, which now provides hypermedia access to the Internet for global information sharing.

Berners-Lee created the Web in 1989 while working at the European Laboratory for Particle Physics (CERN) in Geneva. His dream was to provide a systematic way for people to share knowledge and work as a team.

Berners-Lee based his research on how brains use random associations to link thoughts. The idea was to provide a way for scientists to share research information, whether they were in Australia, the U.S. or anywhere in the world.

"I found that all attempts at a database or document system describing projects forced information into a very strict structure," Berners-Lee explains. "It was only useful for describing things with a strict structure." The missing ingredient was random association.

Titles: Director of WWW Consortium and a research scientist at MIT's Laboratory for Computer Science

Chief innovation: Creator of the Web

Education: B.A. degree in physics in 1976 from Oxford University in England

Internet address: timbl@w3.org

Home page: http:people\ \berners3.lee

The Web is based on a computer architecture that enables individuals to use hypertext media links to navigate a collection of servers worldwide. By clicking on a mouse, users can easily access the thousands of home pages created by individuals, corporations, universities, and religious, secular and government institutions.

"What Tim did technically was a combination of vision and simplification in a world of complexity," says Massachusetts Institute of Technology Professsor Michael Dertouzas, director of the MIT Laboratory for Computer Science and author of the MIT study, "Made in America." "We already had all the pieces — hypertext and networks — but Tim blended the two into a single idea. He saw these individual threads as creating a web that is highly scalable."

Mike Sendall, senior scientist at CERN who worked closely with Berners-Lee, agrees. "Because of the distributed nature of the physics community, CERN was fertile ground for development of the Web," he says. Approximately half of the world's particle physicists use the CERN laboratory for research and want to continue to keep abreast of developments when they return their universities.

Sendall was manager of the Data Acquisition Group when Berners-Lee first joined CERN as a fellow. While at CERN, Berners-Lee provided computer support for physicists worldwide and also worked on the Fast Bus, a standard used by physicists to link data acquisition equipment.

Berners-Lee is now director of the WWW Consortium and research scientist at MIT's Laboratory for Computer Science in Cambridge, Mass.

The WWW Consortium was formed to coordinate development of the Web because of the number of companies involved in Web software development efforts.

Berners-Lee's background is in real-time communications and text processing software development. He is a native of London and holds a degree in physics from Oxford University.

"Dynamic, creative and full of new ideas" is how Sendall describes the developer of the Web. He points to Berners-Lee's strong sense of aesthetics, interest in architecture, love of the theater, participation in amateur opera productions in Switzerland and the ability to motivate colleagues to experiment with new computing techniques.

Some might say that it is all in the family. Both of Berners-Lee's parents are mathematicians, and his father is keenly interested in how brains function.

He tends to think about many things simultaneously and speaks very fast, according to Sendall. Some colleagues tried unsuccessfully to slow Berners-Lee down by asking him to speak French instead of English.

The Web's successful development can be attributed to a set of good ideas clustered together, clever engineering decisions and the right timing, Sendall says.

Berners-Lee struck a balance between the simple and the complex to determine what problems to tackle and how to unify different elements.

"Tim clearly feels that the Web allows individuals to make contributions in a way without structure and that the elements empower the individual," Sendall says.

As director of the WWW Consortium, Berners-Lee will need to make and evolve future standards. He says that this effort will require input from individuals on the network, including grassroots developers worldwide, companies that are placing resources on to the Web, researchers who are evaluating the basic architecture, as well as hardware, software and telecommunications vendors.

"The greatest difficulty for the Web is the potential for people to enhance standard protocols," Berners-Lee explains. "That could result in a loss of interoperability, which is why I was encouraged to form the consortium. I am also concerned that law and politics regarding cryptography will make life difficult for software developers in the U.S.

"The reason that the WWW is interoperable stems from our collaboration and openness with all people who informally got together to start it," Berners-Lee emphasizes. "This is very important, and the continued growth of the Web depends on a continual spirit of openness to work together."

For someone who once considered a career in architecture, construction of the Web seems an appropriate achievement. Yet Berners-Lee is modest and unassuming about what is hardly a trivial computer architecture feat.

He credits Sendall and Robert Cailliaux at CERN for their encouragement and vision in seeing the potential of the Web. When asked about his accomplishments, the devoted father of two young children unequivocably answers, "The growth of the WWW is trivial compared to the growth of a child."

→ Jacobs is a writer based in Framingham, Mass. She can be reached at pjacobs@world.std.com.

Two Ways to Receive Free Information

Reader Service

Use this coupon or prepaid post card in the February 13th, February 20th and February 27th and. Circle Reader Service numbers of ads that interest you and complete the information below. *Expires 5/29/95*

Name: ____________________

Title: ____________________

Company: ____________________

Phone: (   ) ____________________

Street: ____________________

City: ____________________

State:__________ **Zip:**__________

217	218	219	220	221	222
223	224	225	226	227	228
229	230	231	232	233	234
235	236	237	238	239	240
241	242	243	244	245	246
247	248	249	250	251	252
253	254	255	256	257	258
259	260	261	262	263	264
265	266	267	268	269	270
271	272	273	274	275	276
277	278	279	280	281	282

Mail to: NW P.O. Box 5090, Pittsfield, MA 01203 or,
Fax to: NW at (413) 637-4343 *2/13/95*

FaxNET

Here's how it works:

- Dial **1-800-664-8271**, wait for the prompt and follow instructions.
- Key in advertisers' 5 Digit Number listed below.
- Information requested will be faxed to you immediately.

CENTURY SOFTWARE	30540
COMPUTER TELEPHONY EXPO	30550
DATACOM DISTRIBUTIONS	30570
DISTINCT CORPORATION	30100
FRONTIER TECHNOLOGIES	34260
HOLLISTER ASSOCIATES	30500
INTERCON SYSTEMS	30510
INTEGRATED NETWORK CORPORATION	30520
PLEXCOM	30060
PRESTICOM	30560
PROCOM TECHNOLOGY	30320
SYSTEMS AND SYNCHRONOUS	30400
WEST HILLS LAN SYSTEMS	30410

There is no cost to you to receive information on these network products and services!

PRESTICOM integrates SNA and LAN traffic for Remote Office Connection

FRAMES BECOME CELLS:
UNIQUE CELL-BASED PROTOCOL PRIORITIZATION
FASTER RESPONSE TIME
NO TIMEOUTS
FRAME RELAY

PRESTICOM

Presticom's NetPerformer meets the challenge of Internetworking with outstanding performance and reliable response times for both point-to-point and meshed networks. Our unique **Cell Relay** technology lets you overcome the difficulty of integrating bursty LAN traffic with delay-sensitive legacy (SNA) traffic. We built our success on products that make protocol integration work; we now combine protocol prioritization with **ATM**-inspired virtual connections to offer you a **complete Internetworking solution** that is scalable.

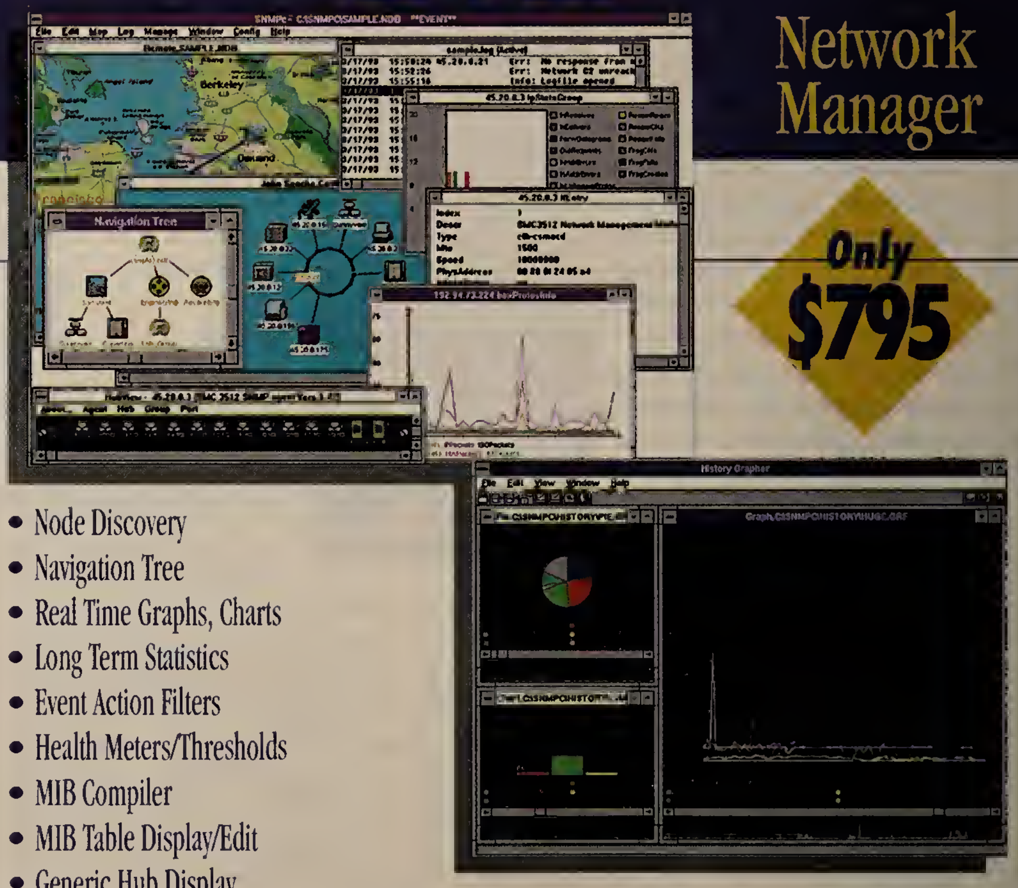
Simply call us for your free technical brief:
Telephone: **(514) 443-2909** Fax: **(514) 443-2878**
3275, 1st Street, Suite 1, St-Hubert (Qc) Canada J3Y 8Y6

See us at NetWorld Interop in Las Vegas: Booth 2554

Circle Reader Service No. 242

SNMPc

Network Manager



Only $795

- Node Discovery
- Navigation Tree
- Real Time Graphs, Charts
- Long Term Statistics
- Event Action Filters
- Health Meters/Thresholds
- MIB Compiler
- MIB Table Display/Edit
- Generic Hub Display
- DDE API Interface

1-800-331-SNMP
Phone (408) 366-6540 Fax (408) 252-2379

Castle Rock Computing
20863 Stevens Creek Blvd. Suite 530 Cupertino, CA 95014

Circle Reader Service No. 252

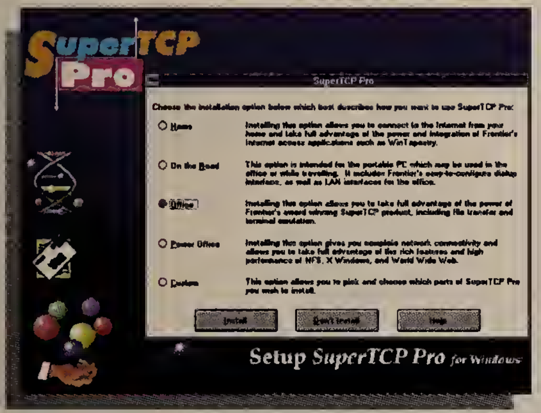
New SuperTCP Pro™ From Frontier Technologies.

The first all-inclusive Internet, TCP/IP and X-Windows networking applications program.

Finally, all the connectivity you need in one integrated package. Whether you're in the office, on-the-road, or at home, SuperTCP Pro provides complete support for more networking applications than any other product. Simply select your work environment and SuperTCP Pro installs itself in minutes from CD-ROM or floppy. Switch instantly between LAN and remote dial-up mode. Surf the Internet. Run X applications. Access NFS servers. Fax from your desktop. SuperTCP Pro is easy to use, easy to administer and, at a $595 single copy price, very easy on your budget.

Award-Winning TCP/IP Applications

Frontier Technologies' 32-bit VxD-based SuperTCP technology is the best in its class. We have the awards to prove it. SuperTCP Pro includes every TCP/IP application you'd expect, and more. Installation is performed entirely through Windows.



Choose the installation option below which best describes how you want to use SuperTCP Pro:

○ Home — Installing this option allows you to connect to the Internet from your home and take full advantage of the power and integration of Frontier's Internet access applications such as WinTapestry.

○ On the Road — This option is intended for the portable PC which may be used in the office or while travelling. It includes Frontier's easy-to-configure dialup interface, as well as LAN interfaces for the office.

● Office — Installing this option allows you to take full advantage of the power of Frontier's award winning SuperTCP product, including file transfer and terminal emulation.

○ Power Office — Installing this option gives you complete network connectivity and allows you to take full advantage of the rich features and high performance of NFS, X Windows, and World Wide Web.

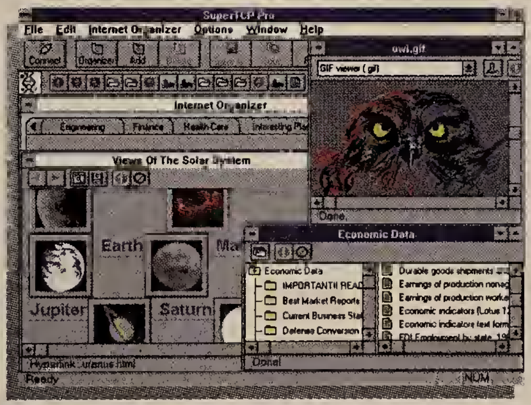
○ Custom — This option allows you to pick and choose which parts of SuperTCP Pro you wish to install.

■ *Automatic tailored installation for use at the office, on-the-road, or at home.*

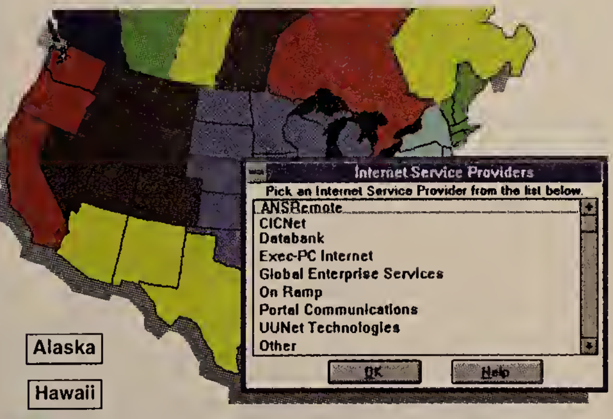
■ *Send and receive multimedia MIME Email messages over the Internet.*

A Revolutionary Internet Access Tool

SuperTCP Pro sets a new standard for Internet browsers. Why waste time waiting for documents to download when you can be launching up to 30 simultaneous Internet requests? Just try doing that with Mosaic! Access WWW, Gopher+, WAIS and FTP sites from within one application. Bookmarks are easily organized by subject matter.



■ *Internet Organizer lets you track information sources by topic.*



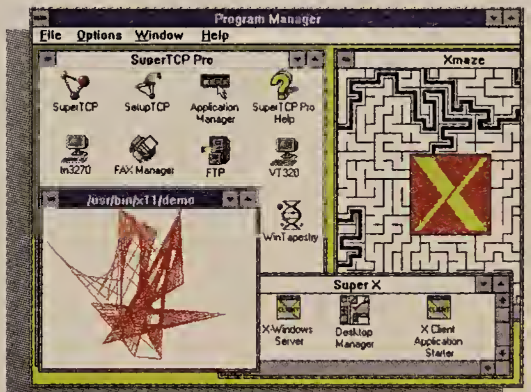
Pick an Internet Service Provider from the list below.

- ANSRemote
- CICNet
- Databank
- Exec-PC Internet
- Global Enterprise Services
- On Ramp
- Portal Communications
- UUNet Technologies
- Other

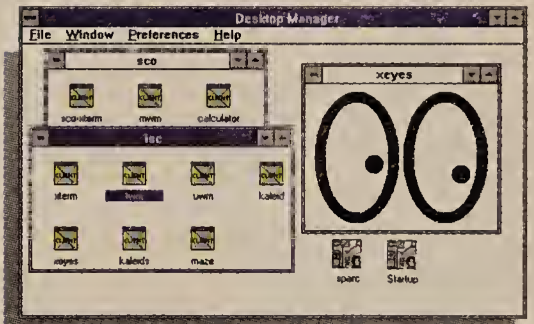
■ *Point and click on any state to view a list of Internet Service Providers in your area.*

Complete UNIX Connectivity With X-Windows and NFS

SuperTCP Pro brings your company's UNIX resources to your Windows desktop. SuperTCP Pro's superior NFS capability lets you view and store files on any remote system. And its new X-Server, based on the X11Release 5 standard, allows you to run UNIX applications on your PC. Now you can access corporate databases and high-end applications without the need for additional X-terminals or UNIX workstations.



■ *SuperX Font Management provides aliases, substitutions and compiling of fonts.*



■ *SuperX Desktop Manager allows Windows-like views of your UNIX environment.*

Call 1-800-929-3054 to order your copy today.

EMAIL SuperTCPPro@frontiertech.com
World Wide Web: www.frontiertech.com

Frontier Technologies Corporation
The Technology Leader in Network Applications
10201 N. Port Washington Road, Mequon, WI 53092

© 1995 Frontier Technologies, Inc. All rights reserved.
All product names are the trademarks of their respective owners.

Circle Reader Service **#274**

The complete NT-1 for ISDN Basic Rate from INC.

It ought to be easy to connect to ISDN Basic Rate Service. And now, thanks to the inspired simplifiers at Integrated Network Corporation, it is.

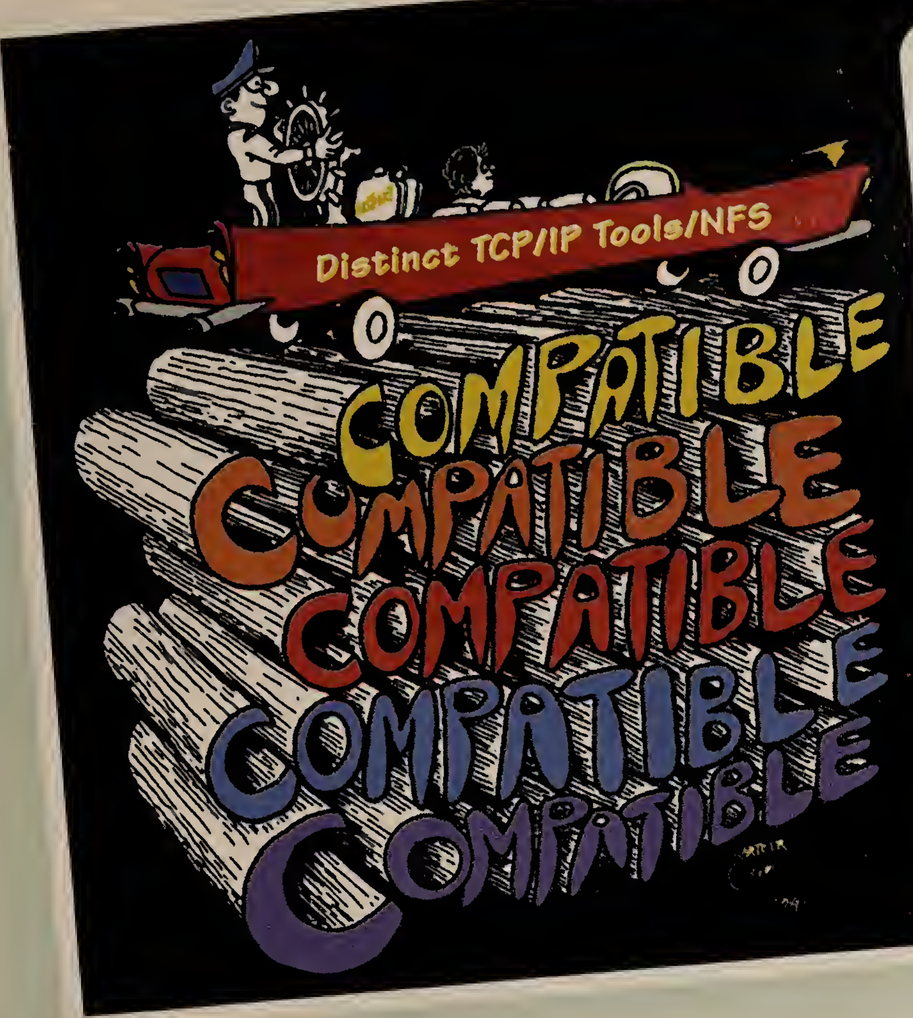
Our NT1 is the surprisingly easy way to bridge the gap between the S/T interface of your ISDN equipment and the U interface that telephone companies require.

We make it easy because we supply all the accessories you need, including the power supply, cables, mounting bracket and hardware – all at no extra charge. What's more, the CM-NT1 also includes diagnostic LEDs for Power as well as S/T and U interface status, which can diagnose just about everything except high cholesterol. And with 99% of all installations, there's no fiddling with switches. That's why we can say that anyone can install our NT1.

Switched Network Access Equipment

For more information, e-mail us at Internet: nt1@info.integnet.com or call us at **1-800-241-EASY**, extension 7681.

*Circle Reader Service #***279**



Runs over Distinct® TCP/IP, Microsoft® TCP/IP and Novell® LAN Workplace

Distinct® TCP/IP Tools/NFS

- *Emulators:* VT and TN3270
- *File Transfer:* FTP Client, FTP Server, TFTP
- *File Sharing:* NFS Client*, NFS Server
  *Mounts drives in Windows or DOS boxes
- *Printer Sharing:* Network Printing from any Windows or DOS application, LPR, LPD
- *Email:* Powerful Email application using SMTP, POP2/POP3
- *Internet:* Gopher, Email, Finger, Whois
- *Network Management:* Network Monitor, SNMP Agent, BOOTP Server, Ping, Network Configuration
- *Serial Connectivity:* SLIP, CSLIP, PPP
- *LAN Connectivity:* Ethernet, Token Ring, ISDN

Distinct TCP/IP Tools/NFS includes Distinct TCP/IP Run Time, combining the best in VxD and DLL technology. Distinct TCP/IP requires only 4KB of memory; is WinSock compliant, installs in less than 5 minutes and automatically detects your existing network operating system.

Specifications are subject to change without notice. Distinct's name and logo are registered trademarks of Distinct Corporation. All product and company names mentioned above are trademarks or registered trademarks of their respective owners. © 1995 Distinct Corporation.

distinct®

Email:mktg@distinct.com
Fastfacts: 408.366.2101
Fax: 408.366.0153
Phone: 408.366.8933

Circle Reader Service #273

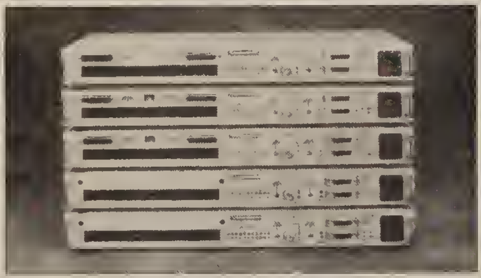
SUPER DISCOUNTS ON NAME BRANDS

THOMAS◆CONRAD CORPORATION SMC 3Com intel SynOptics Xircom

ETHERNET HUBS

Stand alone Hubs

8 Port 10BT Hub, BNC	$160
8 Port 10BT Hub, BNC & AUI Ports	$180
9 Port 10 BT Palm Hub	$175
12 Port 10BT Hub, BNC & AUI ports	$320
16 Port 10BT Hub, BNC	$280
16 Port 10BT Hub, BNC & AUI Ports	$380
6 Port Hub, Fiber Optic Ports SNMP Controlled	$1249
8 Port Hub, BNC SNMP Controlled	$899



Stackable Hubs

Basic Hub 12 10BT+2AUI+1BNC	$599
SNMP Controlled Hub 12 10BT+2 AUI+1 BNC	$795
SNMP Master Hub	$995

TRANSCEIVERS

AUI to TP	$39
AUI to BNC	$39
AUI to Fiber Optic	$220

POCKET LAN ADAPTERS

Pocket Ether TP+BNC	$99
PCMCIA IC Lan Card BNC or UTP	**$170** NEW

REPEATERS

Ether 2 : 2 BNC+2 AUI Ports	$185
Ether 4 : 4 BNC+4 AUI Ports	$310
Ether 6 : 6 BNC+1 AUI Ports	$430

RAID SOLUTIONS

MICROPΩLIS

RAIDON LT 1120 Disk Array Kit with Novell configuration kit	$4495
RAIDON LT 2100 Disk Array with Novell configuration kit	$5595

TAPE BACKUP SYSTEMS

COLORADO MEMORY SYSTEMS

Jumbo 250 DJ-20 Int.	$182
Power Tape 2Gb SCSI W/control Internal/External	$1045/1199
Power Tape 4Gb SCSI W/control Internal/External	$1620/1830

NETWORK SOFTWARE

NOVELL NetWare

NetWare Lite V1.1		$53
- V2.2	5/10 User	$469/1049
- V2.2	50 User	$2079
- V3.12	5/10 User	$599/1299
- V3.12	25/50 User	$1895/2519
- V4.01	5 User - CD ROM	$899
- V4.01	10 User - CD ROM	$2025
- V4.01	25 User - CD ROM	$2975
- V4.01	50 User - CD ROM	$3599
- SFT3 V3.11	5/10 User	$1610/2500
- SFT3 V3.11	25/50 User	$3326/4825
- SFT3 V3.11	100/250 User	$6928/11968
NetWare Multiprotocol Router		$640
NetWare Multiprotocol Router Plus		$960
NetWare Connect 2 Port		$380
NetWare Connect 8 Port		$1400
NetWare Video Server	5 User	$950
NetWare Video Server	10 User	$1495

Call for Upgrades

ARTISOFT

LANtastic/AI 6.0 Win Single	$76
LANtastic/AI 6.0 Win 6 Pack	$509
LANtastic/AI 6.0 Win 12 Pack	$978
LANtastic/AI 6.0 DOS Single	$68
LANtastic/AI 6.0 DOS 6 Pack	$430
AE-2 16 Bit Ethernet Adapter	$199
16 Bit LANtastic Compatible Adapter	$50

ETHERNET ADAPTERS

Intel Ether Express 16 BNC	$65
3Com Etherlink III 10BT	$104
5/20 Pack	$495/1799
NEW Eagle Etherxpert-16 TP, (5 Pack)	$375
Ether-16T TP - Jumperless, NE-2000 Comp.Novell Approved	**$37**
Ether-16C Coax - Jumperless, NE-2000 Comp.Novell Approved	**$37**
Ether-16CT BNC+TP - Jumperless, NE-2000 Comp.Novell Approved	**$41**
Ether-32CTA Combo, 32Bit EISA	$199
4 Ports Internal Repeater TP+BNC	$159
4 Port Expansion card	$59
Vesa LocalBus Ethernet adapter	**$99**
PCI Ethernet adapter	**$99**

100 Mb/s Fast Ethernet

Compatible with cat. 3 or higher existing 4 Twisted Pair Cable

RJ45 Connectors, Novell Certified

Ether-100-ISA Adapter	$189
Ether-100-EISA Adapter	$315
8 Port Concentrator	$720
2 Port Repeater	$352

LOCAL & REMOTE BRIDGES

Local Bridge	$599
Local Bridge with SNMP	$1395
Remote Bridge with SNMP up to 64Kbps	$1595
Remote Bridge with SNMP up to 2.048Mbps	$2195
Remote Compression Bridge high speed synch. data up to 256Kbps	$1795
Remote IP Router with Bridging Capabilities	$1595

gandalF

LANline 5242, ISDN Remote Bridge ISDN "U" Interface (Direct Connection to ISDN), 128 Kbps Throughput Plus 4:1 Compression	$799
LANline 5220, High performance Remote Bridge, Dual WAN Links, Data Compression upto 8:1, Throughput of upto 1,024 Mb/s using standard 64Kb/s digital circuits	$1700
LANline 5210 Micro Ethernet Bridge	$349
5240/5220 Optimizer	CALL
Gandalf Central Site Concentrator	CALL

PRINT SERVERS

West Hills PrintMate 3000 **$299**
2 Parallel Ports, 1 Serial Port
BNC, AUI and RJ45 Connection
2 Year Warranty

yes

Castelle Lanpress2P2S BNC or RJ45	$525
Intel Netport BNC or RJ45	$439
Eagle NPE 400 Pocket Server	$370

NEW

PCI Ethernet Adapter $99

ETHERNET SWITCHES

NBASE SWITCH COMMUNICATIONS

Ethernet 10Base switch
4 10Base-T and/or AUI Ports
Flow control
Full Duplex 20 Mbps
500,000 pps Engine
Full Broadcast capability
Multiple simultanous connections
Near zero port-to-port switching delay
Fully IEEE 802.3 Compliant

NEW $2599

Kalpana

EtherSwitch
High performance EtherSwitch Technology
Five 10Base-T Ports
50 Mbps Bandwidth
20 Mbps throughput
Plug'n play
Self learning of Network Configuration
Near zero port-to-port switching delay
Fully IEEE 802.3 Compliant

NEW $1599

STARTER KITS

Easy to use starter Kits let you create networks from 2 to 10 users

NOVELL PERSONAL NetWare

2 User Netware Starter KIT
2-Novell Personal NetWare
2-16 Bit Combo Adapter
1-25FT. Length RG58A/U Coax
2-52 Ω Terminators

$190

5 User Netware Starter KIT
1-Novell NetWare 5 User
5-16 Bit Combo Adapter
1-Crimp Tool
10-BNC Connector
2-52Ω Terminator
1-500 FT. Spool RG58A/U

Personal NetWare $490

Novell 3.12 $999

NEW

100 Mbps Starter KIT
100 Mbps "Fast Ethernet" LAN Adapter and Novell DOS 7 in One Convenient Package
LAN Adapter Bundle includes everything needed for "Fast Ethernet" Network Node

CALL

VISA & MASTERCARD

POLICIES...
30 day evaluation period from invoice date. Products must be returned in new condition with all manuals, boxes and material originally received.
Prices, specifications and availability subject to change without notice

Fast Delivery
Most Orders Ship
the Same Day

1-800-FOR-LANS
1-800-367-5267
For Technical
Support call
1-818-773-8171
Fax: 1-818-773-8932

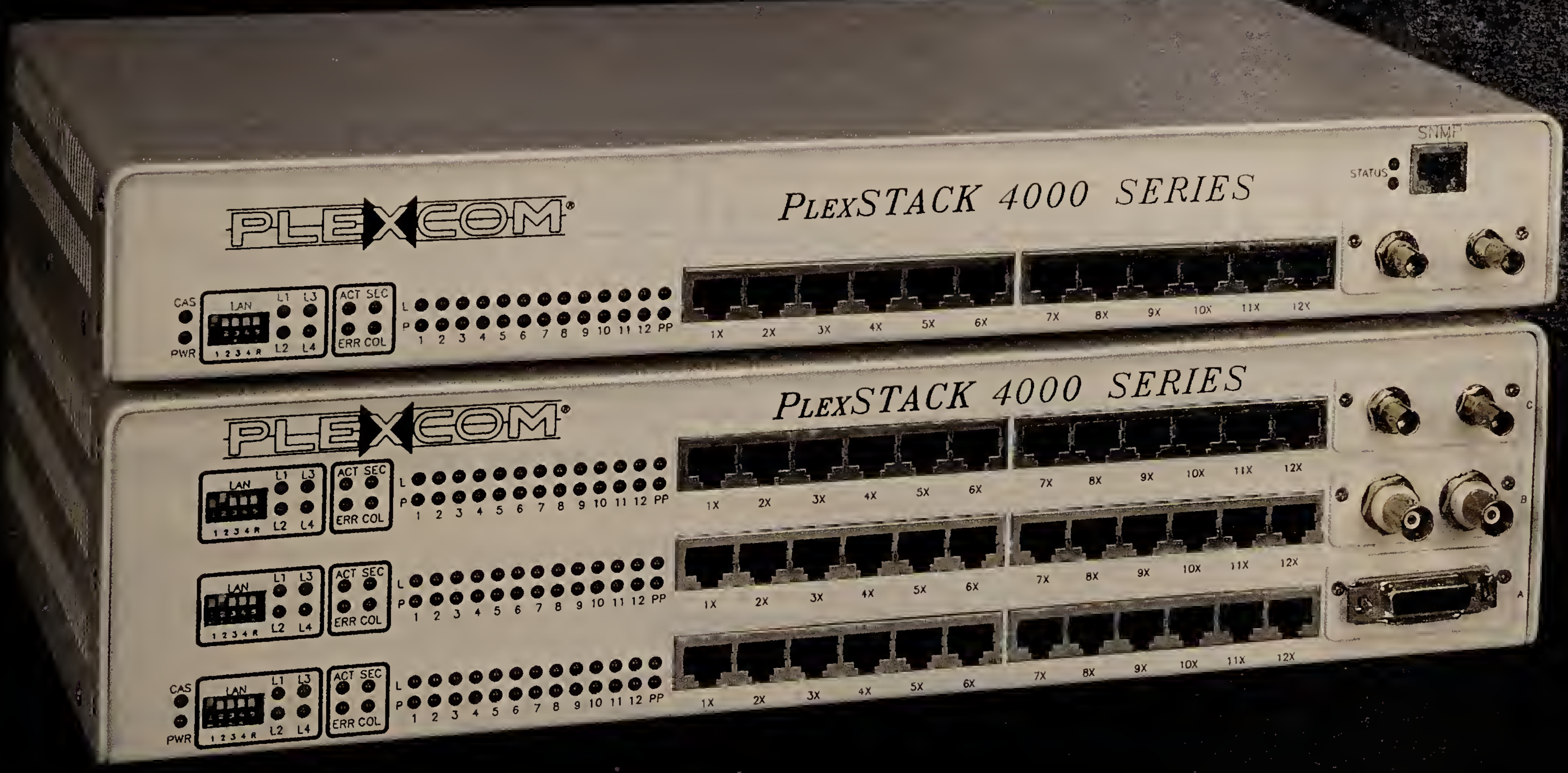
WEST HILLS
LAN SYSTEMS
7949 Woodley Ave , Van Nuys , CA 91406

Circle Reader Service **#253**

PlexSTACK

Stackable Ethernet Hubs

No One On Earth STACKS Up To US!



PlexSTACK offers the ultimate power, capacity, capability, and scalability in a stackable.

The PlexSTACK gives you out of this world performance at down to earth prices.

Compare these advanced features:

- High power i960 RISC-based SNMP agent with MIB II, Novell HMI, and RMON.
- Configure up to 1024 nodes as multiple repeaters or stack up to six chassis for 234 ports as a single repeater.
- 12, 24, 36, or 48 port chassis models.
- Single SNMP agent supports entire stack of 1 to 16 segments.
- Plug and Play ports for flexibility in media.
- Optional per port security.
- Manageability with segment switching control via SNMP.

Plexcom is also a leader in Intelligent Wiring Concentrators featuring a new dual slot 36 port module with built in SNMP and RMON. Call or fax us today for pricing.

1-800 PlexLAN

Introducing
PlexAlert
with
Per Port Intruder Detection

PLEXCOM

2255 Agate Court, Simi Valley, California 93065
(805) 522-3333 ~ FAX: (805) 583-4764

Developer tested only. Novell makes no warranty with respect to this product.

yes
It runs with
NetWare

Circle Reader Service #230

One Stop Shopping for ISA Token Ring Adapters

DataCom ISA Token Ring Adapter Cards Product Comparison

Features	olicom THE NETWORKING COMPANY		intel	proteon	MADGE	SMC	THOMAS•CONRAD CORPORATION	IBM
Model	OC-3118	OC-3117	PCLA 8155	P1392+	AT + RINGNODE	SMC-TRE	TC4145-C	92G7632
Ring Speed	16/4 Mbps		Auto 16/4 Mbps	16/4 Mbps	16/4 Mbps	16/4 Mbps	16/4 Mbps	16/4 Mbps
BUS Interface	8 or 16 bit		8 or 16 bit	8 or 16 bit	8 or 16 bit	8 or 16 bit	8 or 16 bit	8 or 16 bit
Hardware Compatibility	8 or 16 Bit ISA Bus		8 or 16 Bit ISA Bus	8 or 18 Bit ISA Bus	8 or 16 Bit ISA Bus	8 or 16 Bit ISA Bus	8 or 16 Bit ISA Bus	8 or 16 Bit ISA Bus
On-Board RAM	128kb		384kb	128kb	512kb	64kb	128kb	64kb
Interrupts	2/9,3,5,7,10,11,12,16		2/9,3,4,5,7,10,11,12,15	3,4,5,7,9,10,11, or 12	2,3,5,7,10,11,12,15	2,3,4,5,7,10,11,15	2/9,3,5,6,7,10,11,12	2,3,10,11
Data Transfer Mode	DMA or I/O Mapped		Programmed I/O	BUS Master DMA	16 Bit Prog. I/O	DMA or I/O Mapped	DMA or I/O Mapped	Programmed I/O
Connectors & Cabeling	UTP & STP		UTP & STP	UTP & STP	UTP & STP	UTP & STP	UTP & STP	UTP
On-Board Media Filter	YES		YES	YES	YES	YES	YES	YES
Warranty	Lifetime	3 Years	Lifetime	Lifetime	5 Years	5 Years	5 Years	Lifetime
Processor Type	TI TMS380C-16		TI TMS380C-16	TI TMS380C-15	TI TMS380C-16	SMC	TI TMS380C-16	IBM

DataCom Distribution Current Pricing

Qty 1-9	$240.00	$210.00	$220.00	$273.00	$455.00	$239.00	$286.00	$258.00
Qty 10-19	$235.00	$205.00	$215.00	$269.00	$448.00	$232.00	$282.00	$253.00
Qty 20-29	$230.00	$200.00	$210.00	$264.00	$430.00	$227.00	$276.00	$247.00
Qty 30-49	$225.00	$195.00	$205.00	$259.00	$427.00	$220.00	$272.00	$242.00
Qty 50 Pack	$215.00	$190.00	$200.00	$249.00	N/A	$213.00	$269.00	N/A
List Price	$290.00	$505.00	$295.00	$395.00	$595.00	$299.00	$348.00	$295.00

DataCom Distribution
Headquarters
Melbourne, Florida

For information call:

1-800-984-4609

Fax (407) 722-9057

0201

DataCom
Distribution Inc.
1250 South Harbor City Blvd. • Suite 9
Melbourne, Florida 32901

Circle Reader Service No. 223

TCP/Connect II®

for Macintosh & Windows

IT ROCKS!

- Web client for Mac
- SMTP/POP email
- NNTP news
- FTP client & server
- Gopher client
- MIME support
- SLIP & PPP
- TN3270 & VT320

A completely intuitive, integrated software package for both home Internet connectivity, and corporate TCP/IP networks—all from a ROCK SOLID industry leader.

InterCon

InterCon Systems Corporation
950 Herndon Parkway • Herndon, VA 22070
703.709.5500 • 703.709.5555 (FAX)
info@intercon.com (Internet email)
INTER.SALES (AppleLink) NWW 01

For additional information or to obtain an evaluation copy of TCP/Connect II, anonymous FTP to ftp.intercon.com or call 1.800.INTRCON (1.800.468.7266)

Circle Reader Service No. 276

TiP #6

**Windows Connectivity Tip #6:
What's the best way to run a UNIX program from a Windows PC?**

Start with a fast, reliable network connection to your UNIX server. Make sure your network software performs well and keeps up with new technology — the industry standard TCP/IP is best. To get access to all your network printers, be sure to use the LPR network printing protocol from your PC. Then pick a terminal emulation that gives you the best interface for your application — the Wyse 60 or SCO ANSI emulations give virtually the same look and feel as an actual physical terminal. Lastly, fine tune the keyboard mapping to perfectly fit your working preferences.

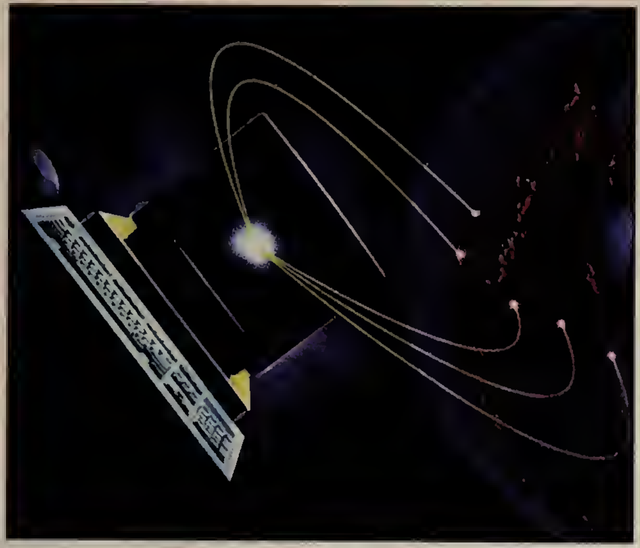
The Best Product:
TinyTERM Plus
The Best Price: $79 per user

Call for a free copy of our *Top 25 Connectivity Tips* and a free demo.

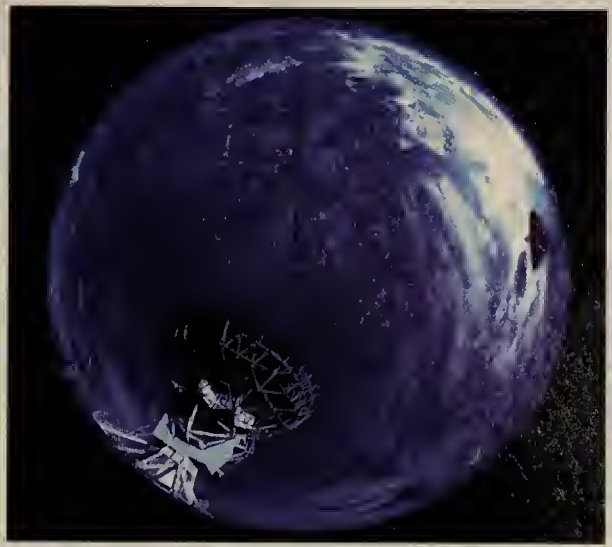
Voice 800-877-3088
Fax 801-268-2772
E-mail sales@censoft.com

CENTURY SOFTWARE
Connectivity That Works

Circle Reader Service No. 282



Computer Networks



Communications

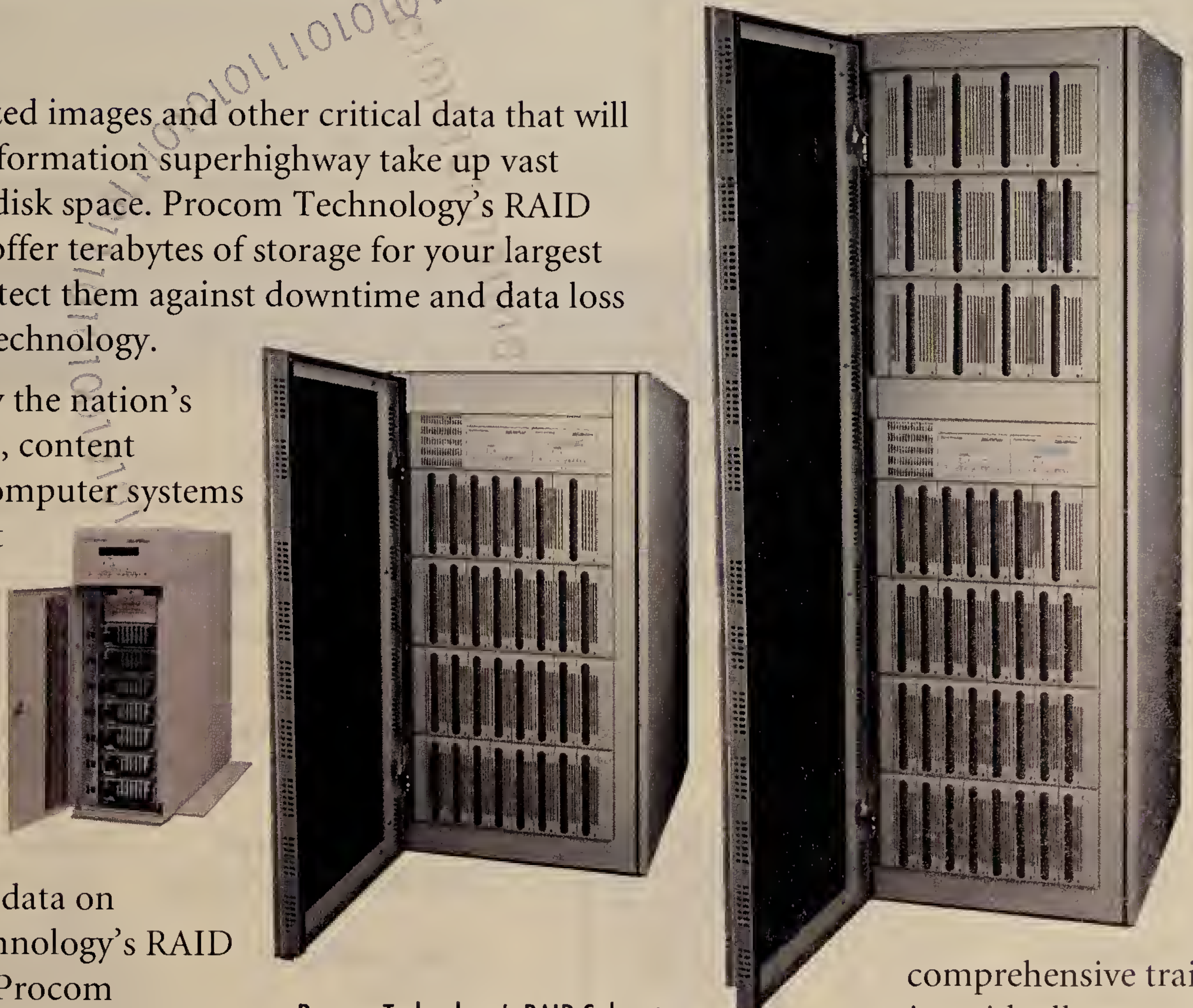
Content Providers

We Get the Picture… on Disk

Procom Technology's RAID Subsystems Deliver Gigabytes to *Terabytes* of Protected Data Storage

The digitized images and other critical data that will cruise the information superhighway take up vast amounts of disk space. Procom Technology's RAID subsystems offer terabytes of storage for your largest files and protect them against downtime and data loss with RAID technology.

That's why the nation's largest telcos, content providers, computer systems management companies, and broadband communication services are already storing their data on Procom Technology's RAID subsystems. Procom Technology's RAID subsystems improve input/output performance by enabling you to tailor the drive systems to match your specific needs – flexibility critical for non-linear video editing and other demanding video applications.



Procom Technology's RAID Subsystems

Procom Technology's RAID subsystems can be easily integrated into most popular network topologies using Windows NT, NetWare, Windows for Workgroups, OS/2, Banyan Vines, SOLARIS, and UNIX. The RAID subsystems also operate on desktops using Windows, DOS, Macintosh OS, and other systems. And of course we offer comprehensive training, installation, and service with all our products.

To learn how Procom Technology's RAID subsystems can help you manage your online images and other data, call Procom Technology today. Remember, image is everything….

Procom Technology, Inc.
Toll-free (800) 800-8600, ext. 414 or (714) 852-1000, ext. 414
Fax (714) 261-7380/E-Mail: info@procom.com

PROCOM TECHNOLOGY

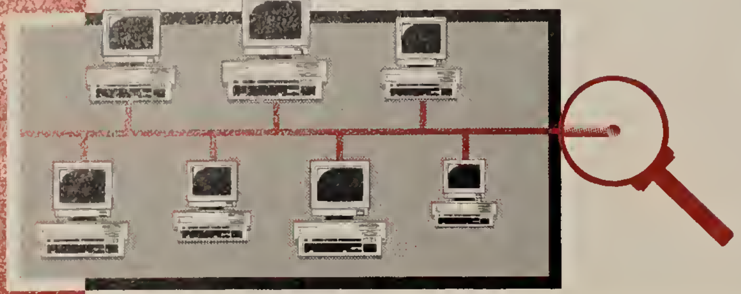
©1995 Procom Technology, Inc. Procom Technology and LANForce are trademarks of Procom Technology, Inc. All other trademarks are the property of their respective companies.

*Circle Reader Service #***233**

A Powerful Software-Based Analyzer that Monitors LAN Networks Easily, Accurately, Affordably.

LANSleuth™ V3.0!

Adds Station, Network and Trend Statistics to Feature Set:



- Windows Based
- NDIS 3.0, ODI and Packet Driver Interfaces
- Supports TCP/IP, IPX/SPX, NCP, Appletalk, SNA
- Station, Network and Trend Statistics
  - Statistics collected are selected by user
  - Data presented in easy-to-read matrix
  - 3D Graphs and Printing
- Intelligent Filters, Triggers and Alarms
- Traffic Generation and PING Utilities

Systems and Synchronous, Inc.
900 E. Diehl Rd. ▪ Ste 110 ▪ Naperville, IL ▪ 60563

A smart investment at a great price!

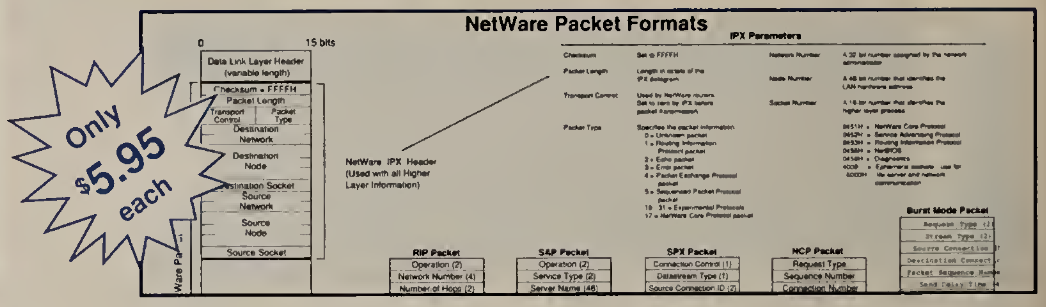
LANSleuth+ 3.0 (Ethernet and Token Ring) $749
LANSleuth 3.0 (Ethernet) $489
Call for other LANSleuth Products and Prices!

To Order Call:
800-419-3496

LANSleuth is a trademark of Systems and Synchronous, Inc. All other brand or product names are trademarks or registered trademarks of their respective companies. ©1994, Systems and Synchronous, Inc.

Circle Reader Service No. 249

Protocol Reference Guides



Save valuable time troubleshooting your internetwork with these Reference Guides. Each laminated guide is 8 $^1/_2$" x 11", double-sided, and available for only $5.95 each, plus shipping. The following titles are available:

LANs	Architectures	WANs	Net Mgt
• LAN Cabling	• AppleTalk	• ATM	• SNMPv1
• Banyan VINES	• DECnet Phase IV	• SONET	• SNMPv2
• Novell NetWare	• GOSIP version 2	• Frame Relay	• RMON MIBs
• Ethernet / IEEE 802.3	• Physical Layer	• SMDS	• Broadband MIBs
• FDDI	• TCP / IP	• ISDN	• The Internet
• Token Ring / IEEE 802.5	• Data Communication	• X.25	• UNIX

All trademarks are the sole property of their respective companies.

Call 1-303-469-0963 for information.

Hollister Associates • P.O. Box 575 • Broomfield, CO 80038
Tel: (303) 469-0963 Fax: (303) 469-9903

Circle Reader Service No. 270

NETWORK WORLD Interactive Product Demos on NetACCESS

Check out these hot products from today's leading technology vendors!
NetACCESS gives you the opportunity to take a test drive and download demos of new products.

Call (508) 620-1160 if you have a 300 to 2400 bps (8N1) modem

Abstraction Software *Modeling/Simulation*	**Dynatech** *Enterprise System*	**Microsoft Corp.** *Windows NT Server*	**Reference Point** *Multimedia Video*
Baranof *MailCheck*	**Express Systems** *Express Meter*	**Microsoft Corp.** *Windows NT Workstation*	**Rolm** *ComManager*
Bellcore *MediaCom Soft.*	**Faulkner** *Faulkner CD-ROM*	**Motorola** *Embarc*	**Teubner & Assoc.** *ESP*
CDI *Network Windows*	**IBM** *OS2*	**Network Dimensions** *Grafbase*	**TRAX Softworks** *TeamTalk*
Dataprobe *Annunciator*	**Kalpana** *Ethernet Switches*	**Ornetix** *SerView*	**UB Networks** *NetDirector*

Interactive Product Demos On Network World's Bulletin Board
Dial (508) 620-1160
(300 to 2400 bps 8N1);
(508) 620-1178 (9600 bps)
NetACCESS

For more information on how to advertise in the Direct Response section and put your Demo disk on NetACCESS, Call (800) 622-1108, ext. 507.

FREE Product Information

sy as

1 2 3

in your name
ddress in space
ded or attach
business card.

cle the number
is card which
sponds to the
er at the bottom
advertisement.

il today or FAX
-637-4343.
ture will be
d to you by the
iser free of
e.

NETWORK WORLD

FREE PRODUCT INFO

Issue Date 02/13/95

Card Must be Received by 05/13/95

① Name ______

Title ______

Company ______

Street ______

City ______ State ______ Zip ______

Phone ______ Fax ______

② CIRCLE THE NUMBER ON THIS CARO WHICH CORRESPONOS TO THE NUMBER AT THE BOTTOM OF THE AOVERTISEMENT.

DISPLAY ADVERTISING

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108

ACTIONCENTER

109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126
127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144
145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162
163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198
199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216

MARKETPLACE

217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234
235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252
253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270
271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288
289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306
307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324

③ If you would like to receive free information concerning the following products, please check the corresponding boxes below:

COMPUTERS/PERIPHERALS
- 600 ☐ Beckup Oevicas
- 601 ☐ Cebling end Cabling Systems
- 602 ☐ Micros/PCs
- 603 ☐ Mainframes
- 604 ☐ Minis
- 605 ☐ Printers
- 606 ☐ Storege Devices
- 607 ☐ Tarminals
- 608 ☐ UPS
- 609 ☐ Workstations

SOFTWARE
- 610 ☐ Applications
- 611 ☐ Client/Sarver Application Oevelopment
- 612 ☐ Communicetion/ Terminel Emuletion
- 613 ☐ Computer Operating Systems
- 614 ☐ Databesa Menagement/ ROBMS
- 615 ☐ E-Mail
- 616 ☐ Groupware
- 617 ☐ LAN Opereting Systams
- 618 ☐ Network Oiagremming
- 619 ☐ Network Manegement
- 620 ☐ Sacurity
- 621 ☐ Suites
- 622 ☐ Systems Managament

INTERNETWORKING
- 623 ☐ Bridges
- 624 ☐ Routers
- 625 ☐ Gateways

LOCAL AREA NETWORKS
- 626 ☐ ATM Switches
- 627 ☐ Etharnet Switches
- 628 ☐ Hubs/Intelligent Hubs
- 629 ☐ LAN Sarvars
- 630 ☐ Local Arae Natworks
- 631 ☐ Network Adapter Boards/NICs

- 632 ☐ Peer-to-Peer LANs
- 633 ☐ Print Servers
- 634 ☐ Remote LAN Access
- 635 ☐ Remote Access/ Communicetion Servers
- 636 ☐ SNMP Network Management
- 637 ☐ Superservers
- 638 ☐ Wireless Networks

REMOTE/WIRELESS COMPUTING
- 639 ☐ Laptops, Notebooks
- 640 ☐ PCMCIA
- 641 ☐ Mobile Oata Equipment and Services
- 642 ☐ Wiralass Oeta Equipment end Services

WAN EQUIPMENT ANO SERVICES
- 643 ☐ ATM
- 644 ☐ CIT (Computer Integrated Telephony)
- 645 ☐ Diagnostic, Monitoring and Test Equipment
- 646 ☐ DSU/CSU
- 647 ☐ E-Mail/On Line Services
- 648 ☐ FAX Boards/Modems
- 649 ☐ Fiber Optics
- 650 ☐ Frame Ralay
- 651 ☐ ISDN
- 652 ☐ Modems
- 653 ☐ PBX
- 654 ☐ SMOS
- 655 ☐ T1, T3, Frectionel T1 Mux and Services
- 656 ☐ Videoconferencing/ Teleconferencing
- 657 ☐ WATS/MTS

OTHER
- 658 ☐ Education and Training

For additional product information call 1-800-664-8271 and follow the prompts.

TAPE HERE — DO NOT STAPLE

FREE PRODUCT INFO

FOLD HERE FOR MAILING

FREE PRODUCT INFO

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 716 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

NETWORK WORLD
PO BOX 5090
PITTSFIELD, MA 01203-9838

TAPE HERE — DO NOT STAPLE

FREE
PRODUCT INFO

FOLD HERE FOR MAILING

FREE
PRODUCT INFO

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 716 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

NETWORK WORLD
PO BOX 5090
PITTSFIELD, MA 01203-9838

NETWORK WORLD

Issue Date 02/13/95

Card Must be Received by 05/13/95

① Name ______

Title ______

Company ______

Street ______

City ______ State ______ Zip ______

Phone ______ Fax ______

② CIRCLE THE NUMBER ON THIS CARD WHICH CORRESPONDS TO THE NUMBER AT THE BOTTOM OF THE ADVERTISEMENT.

DISPLAY ADVERTISING

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108

ACTIONCENTER

109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126
127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144
145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162
163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198
199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216

MARKETPLACE

217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234
235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252
253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270
271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288
289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306
307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324

FREE
PRODUCT INFO

③ If you would like to receive free information concerning the following products, please check the corresponding boxes below:

COMPUTERS/PERIPHERALS
600 ☐ Backup Devices
601 ☐ Cabling and Cabling Systems
602 ☐ Micros/PCs
603 ☐ Mainframes
604 ☐ Minis
605 ☐ Printers
606 ☐ Storage Devices
607 ☐ Terminals
608 ☐ UPS
609 ☐ Workstations

SOFTWARE
610 ☐ Applications
611 ☐ Client/Server Application Development
612 ☐ Communication/Terminal Emulation
613 ☐ Computer Operating Systems
614 ☐ Database Management/RDBMS
615 ☐ E-Mail
616 ☐ Groupware
617 ☐ LAN Operating Systems
618 ☐ Network Diagramming
619 ☐ Network Management
620 ☐ Security
621 ☐ Suites
622 ☐ Systems Management

INTERNETWORKING
623 ☐ Bridges
624 ☐ Routers
625 ☐ Gateways

LOCAL AREA NETWORKS
626 ☐ ATM Switches
627 ☐ Ethernet Switches
628 ☐ Hubs/Intelligent Hubs
629 ☐ LAN Servers
630 ☐ Local Area Networks
631 ☐ Network Adapter Boards/NICs
632 ☐ Peer-to-Peer LANs
633 ☐ Print Servers
634 ☐ Remote LAN Access
635 ☐ Remote Access/Communication Servers
636 ☐ SNMP Network Management
637 ☐ Superservers
638 ☐ Wireless Networks

REMOTE/WIRELESS COMPUTING
639 ☐ Laptops, Notebooks
640 ☐ PCMCIA
641 ☐ Mobile Data Equipment and Services
642 ☐ Wireless Data Equipment and Services

WAN EQUIPMENT AND SERVICES
643 ☐ ATM
644 ☐ CIT (Computer Integrated Telephony)
645 ☐ Diagnostic, Monitoring and Test Equipment
646 ☐ DSU/CSU
647 ☐ E-Mail/On Line Services
648 ☐ FAX Boards/Modems
649 ☐ Fiber Optics
650 ☐ Frame Relay
651 ☐ ISDN
652 ☐ Modems
653 ☐ PBX
654 ☐ SMDS
655 ☐ T1, T3, Fractional T1 Mux and Services
656 ☐ Videoconferencing/Teleconferencing
657 ☐ WATS/MTS

OTHER
658 ☐ Education and Training

For additional product information call 1-800-664-8271 and follow the prompts.

FREE Product Information

Easy as

① ②

1. Fill in your nar
and address in s
provided or attac
your business ca

2. Circle the num
on this card whi
corresponds to t
number at the bo
of the advertiser

3. Mail today or
to 413-637-4343.
Literature will b
mailed to you by
advertiser free o
charge.

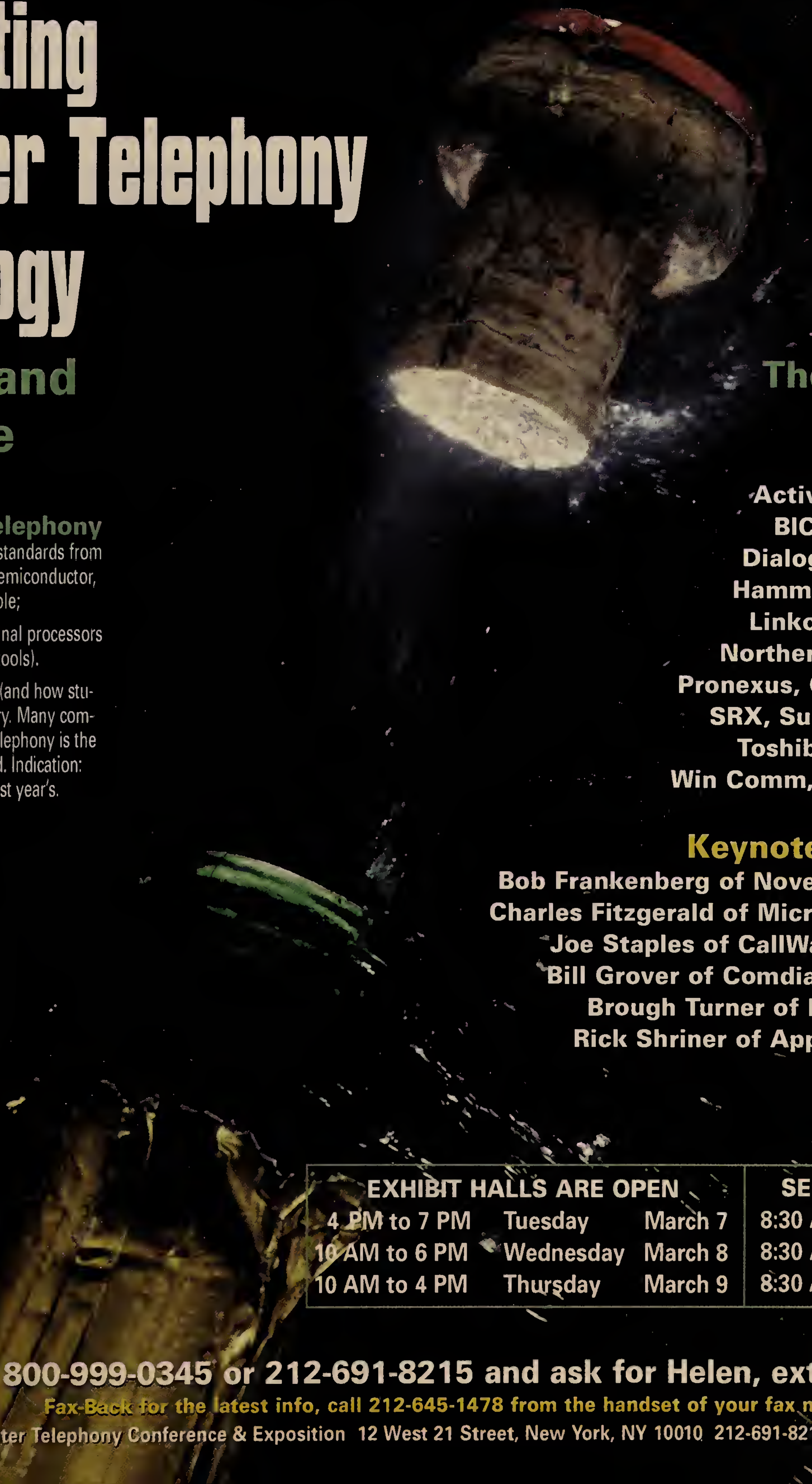
Computer Telephony Defined
Computer Telephony applies computer intelligence to phone calls. The term covers many technologies, including computer-telephone integration via LANs, interactive voice processing (IVR), voice mail, auto attendant, voice recognition, text-to-speech, facsimile, simultaneous voice data, digital signal processing, videoconferencing, predictive dialing, audiotext, "giving data a voice," call centers, help desks, collaborative computing and traditional telephone call switching and call control.

Computer TELEPHONY
CONFERENCE 95 EXPOSITION

MARCH 7,8,9 **DALLAS CONVENTION CENTER**

Celebrating Computer Telephony Technology

Now Real and Deliverable



63 Hours of Seminars

18 Hours of The Killer App Theater

149 Speakers

223+ Exhibitors

Active Voice, Applied Voice, AT&T BICOM, C3, Comdial, Cubix, DEC Dialogic, DSP, Edify, Exacom, Excel Hammer, Harris, I-Bus, IBM, Latitude Linkon, NEC, MCI, Microsoft, Mitel Northern Telecom, Novell, Parity, PRI Pronexus, QNX, Radish, Rhetorex, ROLM SRX, Summa Four, Syntu, Target Tech Toshiba, VCS, Visual Voice, Wildfire Win Comm, and other leading companies

Driving Computer Telephony

1. An explosion of new telephony standards from Microsoft, Novell, Apple, National Semiconductor, Dialogic, Natural MicroSystems, Apple;

2. Miracles happening in digital signal processors (more power, much cheaper, better tools).

3. The "discovering" of telephones (and how stupid they are) by the computer industry. Many computer gurus now believe computer telephony is the hottest computer growth area around. Indication: This year's exhibits are three times last year's.

You'll Learn About
Microsoft's TAPI
Novell/AT&T's TSAPI
Apple's GeoPort
Dialogic's SCSA
Natural MicroSystems MVIP
Intel's Serial Bus

Keynote Speakers
Bob Frankenberg of Novell • Howard Bubb of Dialogic
Charles Fitzgerald of Microsoft • Bill Warner of Wildfire
Joe Staples of CallWare • Dennis King of AVT
Bill Grover of Comdial • Al Wokas of Rhetorex
Brough Turner of Natural MicroSystems
Rick Shriner of Apple • and Harry Newton

EXHIBIT HALLS ARE OPEN		
4 PM to 7 PM	Tuesday	March 7
10 AM to 6 PM	Wednesday	March 8
10 AM to 4 PM	Thursday	March 9

SEMINARS WILL BE HELD FROM		
8:30 AM to 4 PM	Tuesday	March 7
8:30 AM to 6 PM	Wednesday	March 8
8:30 AM to 5 PM	Thursday	March 9

To Attend, call 800-999-0345 or 212-691-8215 and ask for Helen, ext.215 or Karen, ext.272

Fax-Back for the latest info, call 212-645-1478 from the handset of your fax machine

Computer Telephony Conference & Exposition 12 West 21 Street, New York, NY 10010 212-691-8215 Fax 212-691-1191

Two Ways to Receive Free Information:

Reader Service

Use this coupon or prepaid post card in the February 13th, February 20th and February 27th issues. Circle reader service numbers of ads that interest you and complete the information below.

Mail to: Network World, PO Box 5090, Pittsfield, MA 01203 or FAX Network World at 413-637-4343

Expires 5/29/95

Name:____________________
Title:____________________
Company:____________________
Phone (   )____________________
Street:____________________
City:____________________
State:__________ Zip:__________
FEBRUARY

109	110	111	112	113
114	115	116	117	118
119	120	121	122	123
124	125	126	127	128
129	130	131	132	133
134	135	136	137	138

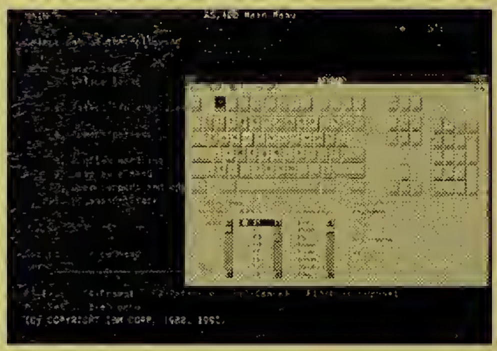
FaxNET

Free Fast Information about the following advertisers.

- Call 1 - 800 - 664 - 8271, wait for prompt, follow instructions.
- Key in advertisers "5" digit number listed below.
- You will receive requested information within minutes.

COMPANY	PIN	COMPANY	PIN
Brixton Systems	**34210**	Isolation Systems	**34380**
Cylink Corporation	**34070**	Network TeleSystems	**34490**
Dataprobe	**34080**	Process Software	**34430**
Internet Security Corp.	**34450**		

Connectivity - Circle #109



WE'RE TALKING 5250 EMULATION FROM ANY PLATFORM.

Access your AS/400 applications and databases from virtually any platform, with Brx5250 emulation software from Brixton Systems. Brx5250 works with • Sun Solaris (SPARC & x86) • RS/6000 • HP-UX • SCO Unix • UnixWare • Windows 3.1 • and Windows NT.

Move to open systems while leveraging your legacy hosts. Get full emulation capability, including print and file transfer. Plus a feature-rich GUI with windows, menus, and cut-and-paste capability between applications.

Leaders in software connectivity. The Brx5250 is part of a complete family of Brixton software that can link all your TCP/IP and SNA users, networks, and databases. Since it's all software, you're not tied to specific hardware. You build on your existing resources, and you keep your future hardware options completely open.

Find out why nearly 100 of the Fortune 500 are connecting with Brixton. Call today. Our 5250 emulation is a lot more than just talk.

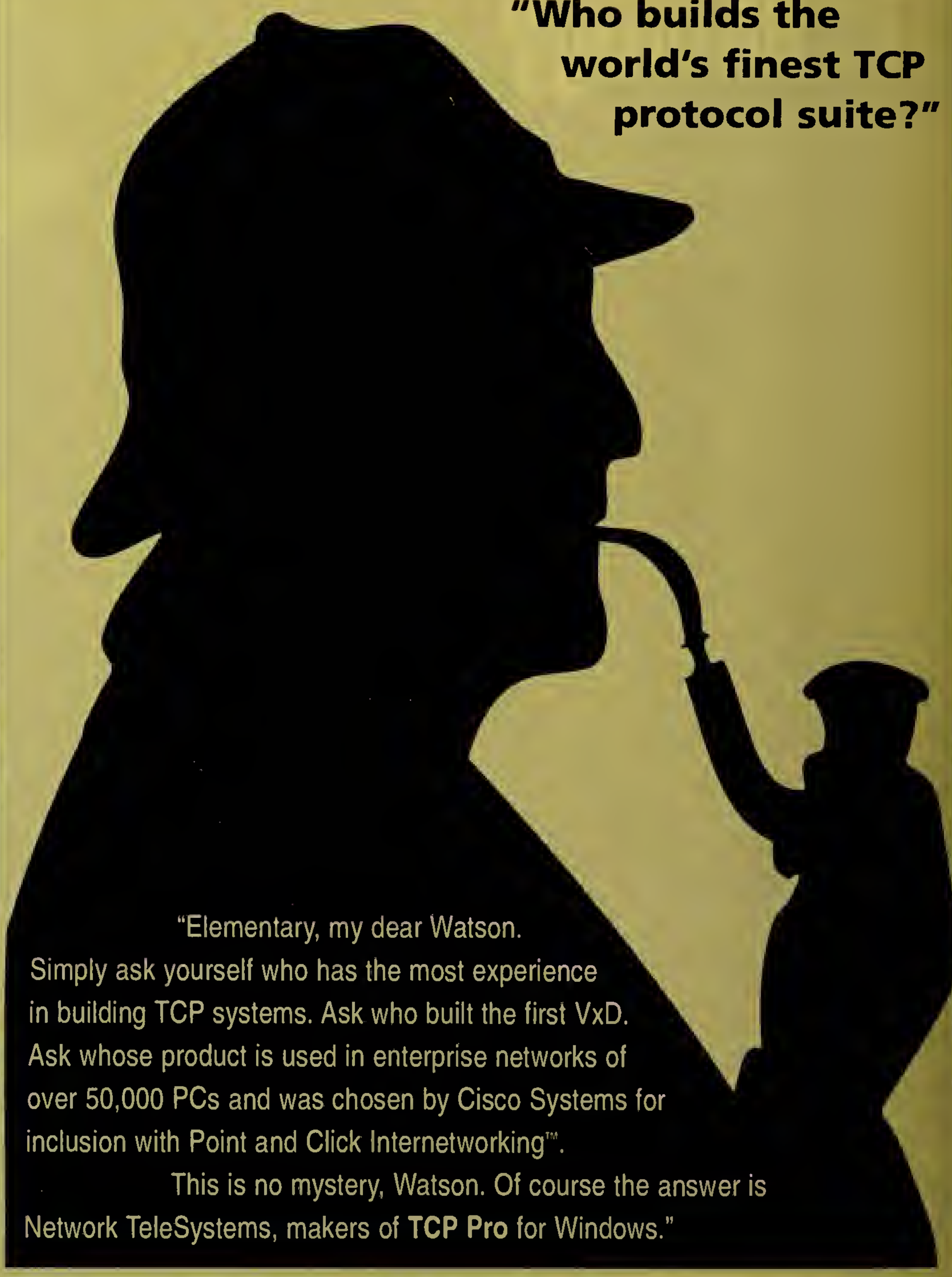
TALK TO US.

1-800-BRIXTON

All trademarks are the property of their respective owners.

Brixton Systems, Inc., 125 CambridgePark Drive, Cambridge, MA 02140 USA

Connectivity - Circle #110



"Who builds the world's finest TCP protocol suite?"

"Elementary, my dear Watson. Simply ask yourself who has the most experience in building TCP systems. Ask who built the first VxD. Ask whose product is used in enterprise networks of over 50,000 PCs and was chosen by Cisco Systems for inclusion with Point and Click Internetworking™.

This is no mystery, Watson. Of course the answer is Network TeleSystems, makers of **TCP Pro** for Windows."

TCP PRO™ THE INTELLIGENT CHOICE

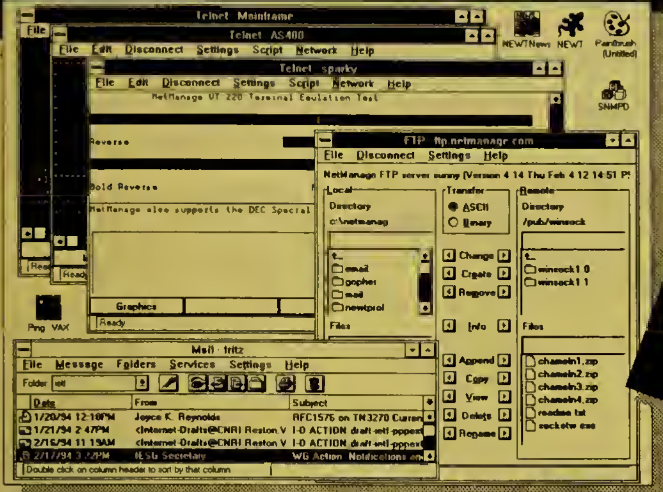
BE SMART–CALL OR WRITE TODAY FOR MORE INFORMATION

Network TeleSystems

(800) 990-4PRO
3990 Freedom Circle • Santa Clara, CA • 95054
info@ntsi.com • fax (408) 496-4441

TCP/IP Networking - Circle #111

TCP/IP Applications for Windows



New Version! CHAMELEON™4.0

AUTOMATIC INSTALL OVER ODI OR NDIS

Implemented as 100% DLL (not a TSR)
Requires only 6KB of base memory
Installs in 5 minutes

More Windows applications than any other TCP/IP package

Applications:
Telnet (VT100, VT220, TVI), TN3270, TN5250, FTP, TFTP, SMTP Mail with MIME, News Reader, PROFS Mail, LPR/LPD, Ping, Bind, Finger, WhoIs, Gopher, Phonetag, Scripting, Statistics, Custom, SNMP Agent

Developer Tools:
- Windows Sockets API
- Berkeley 4.3 Socket API
- ONC RPC/XDR
- WinSNMP API

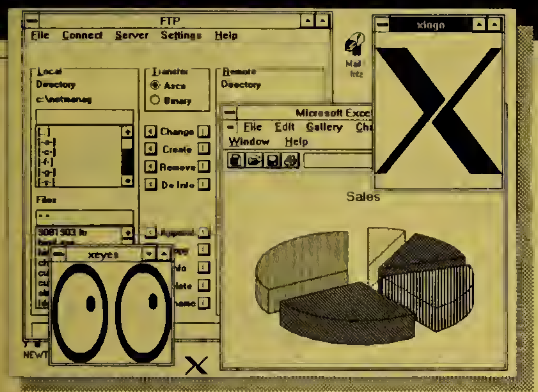
BUYERS ASSURANCE SEAL
May 1993

NEW! Gopher Client, TN5250, LPR/LPD
MIME Support in Mail, Scripting

For overnight delivery call:
NETMANAGE™
(408) 973-7171
NetManage, Inc.
10725 North De Anza Blvd., Cupertino,
CA 95014 USA Fax (408) 257-6405

Circle #112

X for Windows



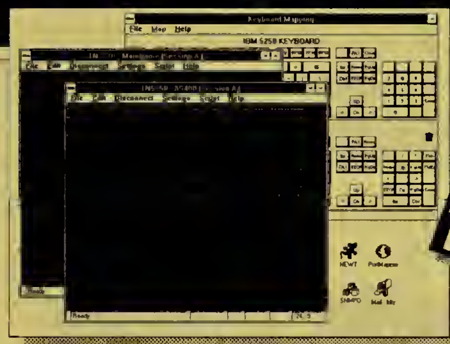
New Version:
- Compliant with X11R5 Standard
- Exploits full 32-bit architecture
- Takes only 10 minutes to install both X and TCP/IP
- Implemented as a 100% DLL (not a TSR)
- Requires only 6KB of base memory
- XRemote, super fast dial-up option

2 Products In 1
X Server &
TCP/IP Stack
Optimized Pair

For overnight delivery call:
NETMANAGE™
(408) 973-7171
NetManage, Inc.
10725 North De Anza Blvd., Cupertino,
CA 95014 USA Fax (408) 257-6405

Circle #114

TN3270 TN5250 for Windows



Included in CHAMELEON™4.0
FREE TELNET

Comes with complete Internetworking Desktop Suite:
TELNET (VT100, VT220, TVI), TN3270, TN5250, FTP, TFTP, SMTP Mail with MIME, News Reader, PROFS Mail, LPR/LPD, Ping, Bind, Finger, WhoIs, Gopher, Phonetag, Scripting, Statistics, Custom, SNMP Agent

- Hotspots for faster Windows operation
- Visual Script Editor and Visual Script Player tools for automatic operation
- Drag and drop keyboard remapping
- HILLAPI Interfaces
- AS/400 Office Vision support
- IND$FILE file transfer for 3270
- Full APA Graphics including graphic mouse for 3270
- Up to 128 simultaneous sessions
- Works concurrently with Novell NetWare, Microsoft LAN Manager, Banyan Vines, Windows for Workgroups

For overnight delivery call:
NETMANAGE™
(408) 973-7171
10725 North De Anza Blvd., Cupertino,
CA 95014 USA Fax (408) 257-6405

Circle #113

NFS for NT

CHAMELEON32/NFS™
NFS • RPC
WINSOCK COMPATIBLE

First ever NFS client and server for Windows NT

- Up to 24 network drives
- Long file name support
- FAT and NTFS file system support
- Included in Chameleon32*NFS*
- Chameleon32*NFS* applications include: Telnet terminal emulation (VT100, VT220, TN3270), FTP (client and server), News Reader, TFTP, Ping, Bind, Finger, and WhoIs
- Available for Intel, Alpha and MIPs platforms

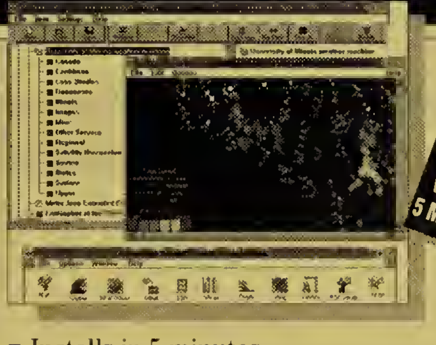
For overnight delivery call:
NETMANAGE™
(408) 973-7171
NetManage, Inc.
10725 North De Anza Blvd., Cupertino,
CA 95014 USA Fax (408) 257-6405

Circle #115

Internet Chameleon™

TCP/IP FOR WINDOWS

Office Home Remote



New Version! INTERNET CHAMELEON™
100% DLL
WinSock Stack
5 Min. Installation

Internet Connectivity Software: Dial-Up, SLIP, PPP and ISDN, Pre-Configured for Popular Internet Providers

- Installs in 5 minutes
- Native Windows installation and ease of use

Applications:
Electronic Mail (SMTP, POP) with MIME and Rules, Internet News Reader, Gopher Client, File Transfer: FTP, TFTP, and FTP Server; Telnet, Utilities: Ping, Finger, WhoIs; SLIP & PPP Dial-Up Connections

For overnight delivery call:
NETMANAGE™
(408) 973-7171
10725 North De Anza Blvd., Cupertino,
CA 95014 USA Fax (408) 257-6405

TCP/IP Networking-Circle #116

Attention Windows NT and UNIX Administrators!

Here's the cost effective NFS server you've been looking for.

NFSware Handles Any File.

- *Exports any local or* ***network*** *directory.*
- Designed as native Windows NT application. Not a port of DOS or Windows NFS.
- Supports NTFS; FAT for MS-DOS; HPFS for OS/2; and CDFS for use with CD drives.

Any Client.

- NFS V.3, NFS V.2, and NFS over TCP and UDP.
- Supports PC clients through *pcnfsd* – no UNIX required.
- Full 32-bit multi-threaded architecture for peak performance.
- GUI interfaces take the work out of creating security databases.
- TCP/IP stack independence gives maximum flexibility.
- Supported by Process' TCPcare service umbrella.

Any Time.

24-hour fax line 508-879-0042 or call 800-722-7770 today!

NFSware Server Software: Quantity 1: $295; 5-Pack: $1,330; 10-Pack: $2,360.
A 30-day evaluation package is available over the Internet.

We accept:
American Express
MasterCard
Visa

NFSware
Solutions by Process Software Corporation

Process Software
Corporation
959 Concord Street
Framingham, MA 01701

Voice: 508-879-6994
Fax: 508-879-0042
E-mail: info@process.com
Web: www.process.com

Bridges/Wireless-Circle #117

Our Wireless Bridge Goes All The Way.

Guaranteed Throughput Up to 15 Miles. Why go halfway? Cylink's new Ethernet bridge *guarantees* full useable throughput in each direction, no matter what the traffic, the distance (15 miles) or the weather.

Full duplex operation increases efficiency by eliminating end-to-end collisions and reducing radio overhead. The result is a link capacity of 1,972 64-byte packets. Only useful packets are transmitted thanks to full wire rate filtering.

This fully featured, fully integrated bridge lets you manage both bridge and radio with SNMP. The AirLink Bridge supports all network operating systems and prorocols, and features remote software download and redundant wireless or wired link with automatic switchover. All srandard LAN interfaces are built-in. The AirLink Bridge can even hub several links from a single point.

Call **1-800-533-3958** for more information on the first fully featured wireless bridge that's guaranteed not to leave you stranded.

AIRLINK

CYLINK.

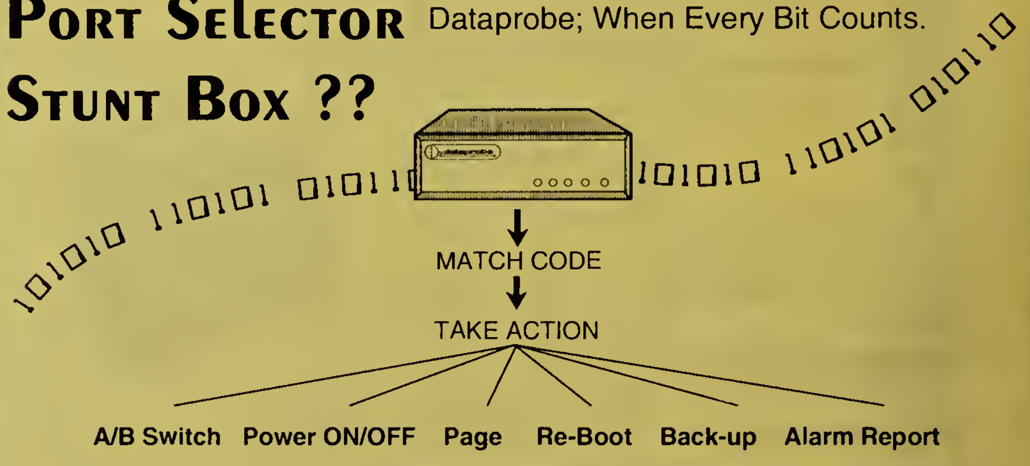
Cylink Corporation, 910 Hermosa Court, Sunnyvale, CA 94086
U.K: Cylink LTD., Hampshire Tel: 44 256-46 8186 Fax: 44-256-24156 Singapore: Cylink Corporation Tel: 65-336-6577 Fax: 65-334-1429
Cylink and AirLink are trademarks of Cylink Corporation

Code Controlled Switching-Circle #118

STRING ALARM
CODE SWITCH
DATA TRAP
PORT SELECTOR
STUNT BOX ??

No matter what you call it, Dataprobe has the product that does the job for you.

When ACTION is required; triggered by a data code, call the code that gets RESULTS.....201-967-9300
Dataprobe; When Every Bit Counts.



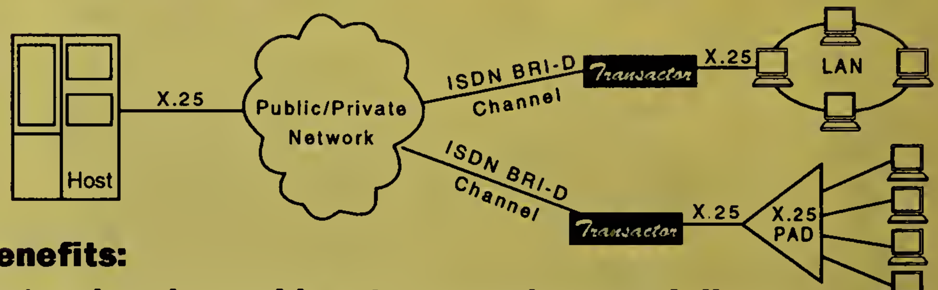
dataprobe

11 Park Place / Paramus, New Jersey
201-967-9300 Fax: 201-967-9090

ISDN/Frame Relay/X.25 Access-Circle #119

How can you substantially reduce your X.25 network access cost $$?

Install an ISDN-X.25 *Transactor!*



Benefits:

- ✔ Reduced monthly X.25 network access bill
- ✔ Completely digital service at up to 16Kbps over ISDN lines
- ✔ No changes to your application — Plug & Play

Ask about our Frame Relay & X.25 Access products

microtronix
200 Aberdeen Drive, London, Ontario, Canada N5V 4N2
Tel: (519) 659-9500 Fax: (519) 659-8500 Tlx: 064-5642

Internet Security-Circle #120

Internet Security

"BEST OF SHOW" INTEROP '94

NEW!

FireWall-1™

Software To Prevent Unauthorized Access To Your Internal Network

- ✔ Advanced filtering technology combines both application-level security and intelligent packet filtering
- ✔ Secure Access to *all* Internet services, including **Mosaic**
- ✔ Transparent to end users – requires no intermediate proxy gateway server
- ✔ Powerful Auditing and Alerting informs you immediately of any unwanted communications attempts

To receive a white paper on firewall technology or to arrange for a demonstration of FireWall-1, send e-mail to INFO@SECURITY.COM or call us at

(617) 863-6400

ISC
INTERNET SECURITY
CORPORATION

FireWall-1 is a trademark of Check Point Software Technologies Ltd.

Remote Office Automation - Circle #121

NETWORKS

Established 1980

ENTERPRISE NETWORK COMPUTING AND COMMUNICATIONS SOLUTIONS

Novell • IBI
Hewlett Pa
Unisys • C
Apple • N
Penril • M
Adtran •
Gandalf •
Cisco • N

- Advanced LAN/WAN System Design
- Carrier Facilities
- Wiring & Fiber Optic Systems
- Voice & Data Integration
- Remote Network/Office Buildout
- Complete Project Management
- Installation & Maintenance
- Enterprise Facilities Management
- Expansion & Recovery Planning
- Executive/Technical Training

ell • IBM
t Packard
• Compaq
ewbridge
il • Micom
n • Xyplex
dalf • Best
Cisco • NAT

Fax Us at (305) 389-4220 or Call Us at (305) 389-3880
For an Immediate Assessment of Your Requirements

NETWORKS, INC., 3265 Meridian Pkwy, Suite 104, Ft. Lauderdale, FL 33331

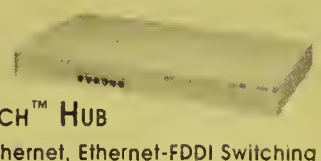
Switching - Circle #123

Increase Bandwidth and MAXIMIZE Network Performance

with 3Com's Best-of-Class Switching Products...

LANPLEX™ 5000, 6000
AND NOW 2000 FAMILY OF
Intelligent Switching Hubs

Maximize network performance with scalable bandwidth -- ranging from shared 10 Mbps Ethernet to private 100 Mbps FDDI pipes, and ATM.



LINKSWITCH™ HUB

Ethernet-Ethernet, Ethernet-FDDI Switching

Part of 3Com's innovative SuperStack™ system architecture, provides the most cost-effective, flexible answer to the need for high-performance Ethernet switching with integrated FDDI.

MAXNET Offers Complete Service and Support for 3Com Products

GUARANTEED...

Lowest Prices • Highest Availability • 100% Satisfaction

AVAILABLE...

Installation • Maintenance Programs • 7 x 24 Online Support

Call for more information on 3Com and other *"Solutions for your network integration"*

1-800-4-MAXNET

Offices throughout the U.S.

MAXNET
communication systems, inc.

MAXNET is your Premier Network Systems Integrator for 3Com.

3Com

3Com

All trademarks are the property of their respective owners.

Security - Circle #122

INTERNET ENCRYPTION

GREAT FOR FRAME RELAY

NEW!

Solve the problem of confidentiality between remote IP's across a TCP/IP based WAN

- Hardware based encryption
- Various encryption algorithms available (domestic, foreign, etc.)
- Supports PING, ARP, IRDP, limited ICMP
- Labeling mechanism allows support for multiple closed user groups
- Ethernet attachable to Cisco routers

ISOLATION SYSTEMS

26 Six Point Rd.
Etobicoke, Ont.
Canada M8Z 2W9
Tel: (416) 231-1248
Fax: (416) 231-8561
1 (800) 387-8706

Phone or fax for specifications and get on our complimentary newsletter mailing list

Seminars

NETWORK WORLD TECHNICAL SEMINARS

Managing the Migration to Client/Server Networks

March 14/15	Chicago, IL
April 5/6	Boston, MA
April 10/11	Los Angeles, CA
April 12/13	San Francisco, CA
April 18/19	New York, NY
May 2/3	Washington, DC
May 8/9	Atlanta, GA
May 10/11	Dallas, TX

REGISTER TODAY FOR THE SEMINAR NEAREST YOU!
800-643-4668

Dial our Fax-Back Line for a complete Seminar Outline.
800-756-9430 - Request Document Code #40

Free Demos

NETWORK WORLD Interactive Product Demos on NetACCESS

Check out these hot products from today's leading technology vendors!
Net*ACCESS* gives you the opportunity to take a test drive and download demos of new products.

Call (508) 620-1160 if you have a 300 to 2400 bps (8N1) modem

Abstraction Software
Modeling/Sim.

Baranof
MailCheck

Bellcore
MediaCom Soft.

CDI
Network Windows

Dataprobe
Annunciator

Dynatech
Enterprise System

Express Systems
Express Meter

Faulkner
Faulkner CD-ROM

IBM
OS2

Kalpana
Ethernet Switches

Interactive Product Demos On *Network World's* Bulletin Board

Dial (508) 620-1160 (300 to 2400 bps 8N1); (508) 620-1178 (9600 bps)

NetACCESS

Microsoft Corp.
NT Server

Microsoft Corp.
NT Workstation

Motorola
Embarc

Network Dimensions
Grafbase

Ornetix
SerView

Reference Point
Multimedia Video

Rolm
ComManager

Teubner & Assoc.
ESP

TRAX Softworks
TeamTalk

UB Networks
NetDirector

For more information on how to advertise in the Direct Response section and put your Demo disk on NetACCESS, Call (800) 622-1108, ext. 507.

Marketplace

Wanted:
Authorized Distributors and Sales Agents

25-9600 ports Non-blocking Advanced Multi-Location Networking
Full Range of Group Videoconferencing Systems

Send company history, annual sales and other relevant information to:
National Distribution Division
Fujitsu Business Communications Systems
1001 Warrenville Road, Suite 200
Lisle, IL 60532

For Multimedia Switching Platform and Videoconferencing Systems

CNE Self Study

Guaranteed CNE Bundle

~~$500~~ **$425**

✓ Seven books for all seven tests
✓ CNE Test Master™ that has more than 2200 practice questions/answers on the disk

Rated "Excellent" by hundreds of students

Call for CNE Training in N.J.
1-800-PCAGE-60

PC Age
420 Rt. 46 E; Ste. 10; Fairfield, NJ 07004
Tel: 201-882-5370 • Fax: 201-882-4955

Circle Reader Service No. 218

Annexus

Fully Integrated
Remote Ethernet Bridges

☑ All WAN components are built-in!
☑ EASY setup & speeds up to 115Kbps
☑ Ideal for branch office connectivity
☑ Voice grade dialup, 56K DDS, Switched 56
☑ IEEE 802.1d Spanning Tree & SNMP
☑ Supports all Ethernet-based protocols

	US$ List
R33A Integrated V.42bis modem, 4:1, 57.6Kbps	$1,495
R33A+ Integrated V.FC modem, 4:1, 115Kbps!	$1,795
R33C Integrated CSU/DSU, SW56 or dedicated	$2,395

CALL or FAX for more information!
(Ask about new router, ISDN, and frame relay products, too!)

Annexus Data Systems
(800) 505-0019 *Toll-free in the U.S.A.*
(619) 530-0096 *Fax*

yes It runs with NetWare

Circle Reader Service No. 267

NEW REFURBISHED BUY SELL NEW REFURBISHED BUY SELL

MSI Communications

Nationwide Service • 24-Hour Technical Support
CNE Services • Trade-In Credit

WAN Products
Adtran
AT&T Paradyne
BAT
Digital Link
INC
Micom
NET
Newbridge
Verilink

Distribution Products
Codex
Datatel
GDC
IBM
Micom
Racal Milgo
Spectron
Symplex
Tellabs
Timeplex
UDS
Vitalink

LAN Products
Cisco
Cubix
Develcon
Invision
Lannet
Multi Access
Synoptics
Wellfleet
Xyplex

Specialized Services
Bell Atlantic Authorized Distributor
Sprint Authorized Agent
NOVELL Certified

Data, Voice & Video Networking
7 Waterloo Road, Stanhope, NJ 07874
800-866-3282 • 201-347-3349 • FAX 201-347-7176

NEW REFURBISHED BUY SELL NEW REFURBISHED BUY SELL

Circle Reader Service No. 232

Category 5

Patch Cords
6 ft.....$1.90
- 24 Awg Stranded
- 50u Gold
- TSB-40a
- Available in 8 Colors

Call for Other Lengths

CAT5 CERTIFIED

Patch Panels
24 PORT..........$85
48 PORT.........$170
72 PORT.........$330
- UL Verified to Category 5 TSB-40
- Extra High Density
- Black Electrostatic Powder Coat

Thin-Net Cabling
RG58, 10 ft....$2.50
BNC T, per 100....$55.00
BNC Crimper (rachet)....$25.00
BNC (Crimp), per 100....$35,00
BNC (Twist-On), per 100....$55.00
RG58/u 95%, 1000 ft....$82.00
RG58 A/u 95%, 1000 ft....$95.00

Wall Plates
Category 5 Single Surf....$3.40
10 Base T Hubs
9 port....$165
16 port+ BN&AUI....$285
Transceivers
10 Base-T....$35
Apple AAUI....$49

Electro Products • Call 1-800-423-0646
Or fax your request to (206) 859-9101

Circle Reader Service No. 228

FREE
FREE
FREE

Call for FREE information on how to make your advertising program work in the Marketplace

Caterina Campisano
800-622-1108

For More Information About Marketplace
Contact Caterina Campisano 1-800-622-1108

LAN – WAN – NEW – USED

3COM...CISCO...SYNOPTICS...CABLETRON...SMC...PROTEON...NETWARE...NETWORTH

Largest New/Used 3Com Inventory Anywhere!

3Com NEW/USED MULTICONNECT CS/CS1/IB1-3 NETBUILDER I-II
3Com NEW/USED FILE SERVERS BICC/ISOLAN LINKBUILDER
3Com NEW/USED NETWORK CARDS PERIPHERALS BRIDGE COMM.

PROTEON (U)
P4500......$3000
P4116........$350
P4118........$400
P4119........$750
P7102........$400
P1300........$200
MORE!......CALL

NETWORTH (U)
4000/10..........$1600
4000/3..............$500
UTPM 12.........$500
4000/ENT........CALL
VLAN TRBO....$125
4000/SAT........CALL
MORE!...........CALL

3Com 10-BASE T HUBS
1627-0................$375
1627-1................$590
1637-1..............$1025
1603-0................$450
16670................CALL
16671................CALL
MORE!...............CALL

3Com 509-TPO $70 Qty. 3

OLICOM 16/4 MB TOKEN $225

INTEL 8100 COMBO $70

SMC ULTRA 16 TP $75 Qty. 3

CABLETRON (U)
THMIM........$700
TPTMIM......$500
MT8MIM......$400
IRBM...........$750
MMAC3.......$250
TPMIM-3.....$350
MT800.........$200
MORE!.......CALL

NETWARE

# of users	3.12	4.1
5	$495	$825
10	$1145	$1775
25	$1545	$2625
50	$1995	$3500
100	$2675	$4800

USED ETHERNET
SMC ELITE 16......$80
SMC ELITE C8O ..$90
WD 8013 CX/TP...$70
IMC DATA MGR .$300
3Com 503/507 ...CALL
CODENOLL.......CALL

NEW NETWORK INTERFACE CARDS

	3Com	SMC	INTEL	NOVELL	CLONE
16 BIT CX/TP	85	80	80	80	50
16 BIT COMBO	110	105	105	105	55
32 BIT CX/TP	195	225	225	425	80
TOKEN 16/4MB	250	250	250	250	250

QUANTITY DISCOUNTS AVAILABLE

SYNOPTICS (U)
3000-01 .....$900
3030-01 .....$400
3512..........$500
3002..........$450
3514ST $1750
2310..........$650
MORE!......CALL

ERGONOMIC INC.
47 Werman CT.
Plainview, NY 11803
516-293-5200
FAX: 516-293-5325

WE BUY & SELL USED LAN/WAN EQUIPMENT • CALL FOR PRICING!
MC VISA **800-AKA-3Com (800-252-3266)** U=Used

Circle Reader Service No. 271

OUR STANDARD STRUCTURES ARE CUSTOM BUILT.
- Network Control Centers
- Multiple LAN File Server Racks
- 19" Rack-Mount
- Multi-user & Individual Workstations

(800) 232-8737

HERGO™
Ergonomic Support Systems, Inc.
A Hertz Technology Group Affiliate
321 Fifth Avenue, New York, NY 10016
TEL: (212) 684-4666 • FAX: (212) 684-6853
To become a Hergo Authorized Reseller, ask for ext. 40.

Circle Reader Service No. 280

THE LOWEST PRICES ON NEW SYNOPTICS EQUIPMENT.

1.800.GET.SNPX

Circle Reader Service No. 226

Just Like A Private Tutor!

New Multimedia Books, Training & Market Reports

ATM Data Networks Frame Relay LAN OSI SONET/SDH X.25 and much more!

The KnowedgeBase™ series, for your PC or LAN, eliminates the expense and delay of traditional seminars and courses. Train engineering, marketing, and sales staffs as well as customers. Equally effective in the office, home, traveling or at remote locations. Stay on the leading-edge with our update service. Call for free catalog!

Interactive Product Demos On Network World's Bulletin Board
Dial (508) 620-1160 (300 to 2400 bps 8N1); (508) 620-1178 (9600 bps)
NetACCESS

Reference Point 1-800-VIP-DISK, Fax (203) 272-7216

Circle Reader Service No. 225

NETWORKS
BUY / SELL / REPAIR

IBM CISCO 3COM CABLETRON PROTEON SYNOPTICS WELLFLEET

COMSTAR Buys, Sells and Repairs NETWORK Equipment.
Token Ring - Ethernet - 5250/3270 Emulation
MAU's/CAU's/LAM's/Hubs - Bridges & Routers

COMSTAR, INC.
The #1 NETWORK Remarketer
612-835-5502
FAX: 612-835-1927
5250 W. 74th St, Minneapolis, MN 55439

LAN/WAN • BUY/SELL
FULLY WARRANTEED
NEW/REFURBISHED
RENTAL
LEASE

MODEMS
DSU/CSU's
MULTIPLEXERS
T-1 EQUIPMENT
HUB, BRIDGES, ROUTERS, ETC.

PRODUCT	DESCRIPTION	PRICE
AT&T	ISN	In Stock
AT&T/Paradyne	3201 T-1 CSU	$795
Cabletron	New or Used	Call
Cisco	New or Used	In Stock
Digital Link	DL-100-102	$1,595
Fibermux	8800 & 6600	In Stock
Kentrox	T-Serv II	$550
NEC	AdpCM Transcoder	$2,850
Telco Sys.	Chan. Bank	Call
Verilink	551-VST-L2	$825

We carry all manufacturers, call John, ext. 101.

PHONE
800-783-8979

FAX (916)
781-6962

ADCS INC.

Circle Reader Service No. 240

DECnet/OSI
VAX PSI
DECnis

Consulting, Migration, Training, and Support

Whether your need for network expertise is transitional or long-term we invite you to see why Creative Computing is the sound choice.

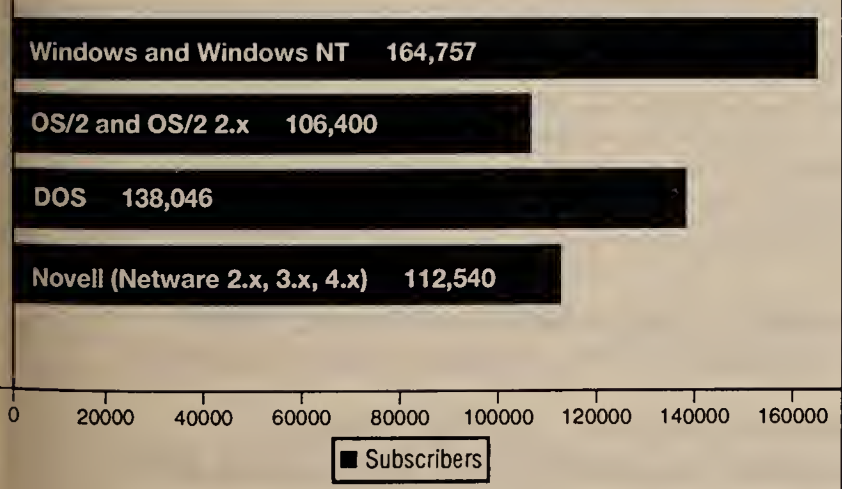
Creative Computing, Inc.

(719)598-4729

CCI
6240 Colony Circle
Colorado Springs, CO 80919
cciinfo@creative-computing.com

OPERATING SYSTEMS...NETWORK WORLD HAS THEM COVERED!

Network World subscribers have the following Operating Systems installed and/or planned:



To reach these influential buyers, call Caterina Campisano at
1-800-622-1108 ext. 465.

BONUS DISTRIBUTION IN MARCH

- Cebit, Germany
- Groupware '95
- NetWorld+Interop '95
- Supercomm/ICA Expo
- UniForum

REFURBISHED
SynOptics®

Largest Inventory of Refurbished SynOptics in America!

- SynOptics Trained
- SynOptics Authorized
- One Year Warranties
- Proven Track Record
- We Stock What We Sell!
- We Buy Used Equipment

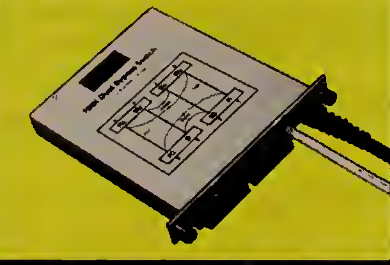
Cabletron NOVELL IBM
Proteon 3COM Wellfleet

$80 3C509-TP
VISA MC

National LAN Exchange
800-243-LANS
1403 W. 820 N., Provo, UT 84601 Voice 801-377-0074 FAX 801-377-0078

Circle Reader Service No. 231

IS FDDI RELIABILITY IMPORTANT TO YOU?



FDDI DUAL BYPASS SWITCH

- ▶ Protects Against FDDI Station Failure or Power Loss.
- ▶ Rack-Mount Option Available.
- ▶ Over 10,000 Units Sold.
- ▶ Low Quantity Price of $650.

DiCon FIBEROPTICS, INC
Tel: (510) 528-0427
Fax: (510) 528-1519

Circle Reader Service No. 222

INFORMATION DATA PRODUCTS CORP.

DSU / CSU'S
MODEMS
MULTIPLEXERS

NEW/REFURB
BUY/SELL/TRADE-IN

AT&T
CODEX
DCA
IBM
MICOM

N. E. T.
PARADYNE
MILGO
UDS
MORE ! !

800-362-3770

Circle Reader Service No. 217

For details on how to put your ad here

Caterina Campisano
1-800-622-1108

SAVE 50% & MORE ON MOST PRODUCTS
BUY/SELL/NEW/USED
VISA LEASE/RENT MC
Reconditioned With Warranty
Modems • Multiplexers • T-1 • CSU/DSU's • Channel Banks

Newbridge Channel Banks	$3995
AT&T CSU/DSU NEW!	$275
T-1 CSU's	$359
CSU/DSU 56KBPS, V.35	$195
Telco Systems Channel Banks	$3995
Wescom Channel Banks	$3995
Datatel DSU/CSU 56KBPS	$375
Vitalink Translan III Bridges	$3995
Stat Muxes 4, 8, 16, 32, port	LOW
Verilink-Connect-1-DSU	$995
Channel Bank Leasing	$299/month

METROCOM
(800) 364-8838 or (713) 783-8838
FAX (713) 783-8832 24 HRS

Circle Reader Service No. 220

Internet Access DIRECTORY

AlterNet, serv. of UUNET
(800) 258-9690 National
info@alter.net
Leased Lines, Frame Relay, ISDN, Web Srvrs, Security, PPP, SLIP, UUCP

ANS Advanced Network & Srvcs, Inc
(800) 456-8267 National
info@ans.net
Leased Lines, SMDS, Frame Relay, SLIP, PPP, ISDN, Security Srvcs

B3NET, service of B3 Corp.
(715) 387-1700 National
info@free.org
SLIP, PPP, Shell, Leased Lines, UUCP, Frame Relay

BBN Internet Srvcs Corp.
BBN/BARRNET
(415) 725-1790 Bay Area
info@barrnet.net
SLIP,PPP,Leased Lines,ISDN, Frame Relay, WWW Srvrs,Security Services
BBN/NEARNET
(800) NEARNET Northeast U.S.
nearnet-join@near.net
SLIP,PPP,Leased Lines,ISDN, Frame Relay, WWW Srvrs,Security Services

CERFnet
(800) 876-2373 National
sales@cerf.net
SLIP, PPP, Leased Lines, ISDN, SMDS, ATM, Frame Relay, WEB Servers

EMI Communications
(800) 456-2001 National
info@emi.com
PPP, Shell, Leased Lines, Frame Relay

Global Enterprise Serv.
(800) 358-4437 National
market@jvnc.net
SLIP, Shell, Leased Lines, ISDN, SMDS, UUCP, Frame Relay

MCI Telecommunications
(800) 955-6505 National
moreinfo@networkmci.com
PPP, Leased Lines, Frame Relay

Microsystems INET Serv.
(801) 532-0316 Northwest
http://www.utw.com
SLIP, PPP, Shell, Leased Lines, UUCP, Frame Relay

New York Net
(718) 776-6811 NY/NJ/CT/PA/MA
sales@new-york.net
SLIP, PPP, Leased Lines, Frame Relay

Performance Sys. Int'l
(800) 827-7482 International
info@psi.com
PPP, Leased Lines, ISDN, UUCP, Frame Relay

Pioneer Global
(617) 375-0200 Boston,Eastern Mass.
info@pn.com
SLIP, PPP, Leased Lines, ISDN, UUCP, Frame Relay, Centrex

SuperNet, Inc.
(303) 296-8202 Colorado
info@csn.net
SLIP, PPP, Shell, ISDN, SMDS, UUCP, Frame Relay, Web Development Srvcs

Call Caterina Campisano at 800-622-1108 x465 for information on how to list your service here.

Novell Netware For Less!!

# Users	5	10	25	50	100	250
v3.12	435	1045	1395	1995	2645	3900
v4.1	*Call for current competitive pricing.*					

Netware upgrades up to 50% off! Save more with our Novell packages.

We will beat or match ANY advertised price!!!

3.12 5 user, 5 16b NIC, 8 Port Hub	$ 745
3.12 10 user, 10 16b NIC, 12 Port Hub	$1545
3.12 25 user, 16 16b NIC, 16 Port Hub	$2345
Netware Connect (2 port)	$ 395
Netware Connect (8 port)	$1385

Ethernet Adapters

NE 2000 TP/BNC	$ 34
3Com509/10BT	each $ 74
3Com509/Combo (5 pack)	each $ 88
SMC Ultra EISA 32 Bit	$ 199

Ethernet Hubs

8 Port w/BNC & AUI Ports	$ 145
12 Port w/BNC & AUI Ports	$ 265
16 Port w/BNC & AUI Ports	$ 345

100 Mbps Fast Ethernet NOW AVAILABLE!!

We carry all brands of network connectivity products! Dealers Welcome!!!

1-800-373-2485
Vandy Micro Corp.
3Com NOVELL
*Visa * MC * AmEx * Fax-A-Check * Corp, Gov't, School P.O.'s*
Fax 714-768-1063

Circle Reader Service No. 221

LAN MARKETING MANAGER

THINK AUSTIN, TEXAS. NOW THINK GREEN.

If you think you know what it's like to live in Austin, Texas...think again. We are an exciting city of gentle hills, lush parks, beautiful lakes, impressive colleges, affordable housing, and year-round, warm weather recreational diversions. In fact, some say we're the most ideal city in the U.S. today.

And then there's the place you'll work...Crystal Semiconductor Corporation. We are a company which is relentless in our pursuit of firsts. An unprecedented legacy of innovation which includes the introduction of the first digital audio multimedia Codec and the first Delta-sigma A/D converter...just to name a few. This company-wide commitment in innovation has made us the fastest growing mixed-signal semiconductor company in the country.

In this high visibility position, you will be responsible for managing a portfolio of innovative LAN products, and establishing Crystal as a leader in the Ethernet marketplace. You will have the opportunity to define future product strategies, and to introduce high-performance Ethernet solutions to PC and LAN systems vendors.

The creative, solutions driven candidate we seek will have at least 4 years experience in either LAN semiconductor marketing, or LAN systems engineering at a PC manufacturer. An in-depth understanding of LAN market and technology trends is required, as is detailed knowledge of Ethernet. Working knowledge of PC bus and performance tradeoffs is a plus. A BSEE degree or equivalent is a must. An MSEE or MBA would be advantageous.

If you're a high performer who is up to meeting this challenge, forward your resume with salary requirements to: **HR-Dept, Job Code 94266, Crystal Semiconductor Corporation, P.O. Box 17847, Austin, TX 78760. FAX: (512) 445-4379.** We are a smoke-free workplace, and an Equal Opportunity/Affirmative Action Employer.

CRYSTAL
A Cirrus Logic Company

REFINING THE ART OF NETWORKING

Network General is the premier name in intelligent network analysis and monitoring applications and services. Founded in 1986, in the last 4 years we have grown from 82 employees and $30 million in revenue to 500+ employees and over $114 million in revenue. This expansion is creating great opportunities on an ongoing basis for industry professionals at our sites in Menlo Park, CA and Beaverton, OR in the following areas:

ENGINEERING

MANAGERS - SOFTWARE DEVELOPMENT

Responsible for management of 5-7 Software Engineers. Must have 5 years' first line management experience plus 8 years' development experience with at least 4 years in Windows, OS/2 or UNIX®. Background should also include having managed client/server or network object models. INMS system design, RDBMS and OODBMS a plus.

QA/SYSTEM TEST ENGINEERS

Responsible for testing products and applications in a LAN/WAN environment on a variety of platforms; PC DOS, OS/2 or UNIX. Prefer 2-5 years' QA/Systems experience and familiarity with network protocols such as TCP/IP, SNMP, UDP, NFS and the OSI 7-layer model.

TECHNICAL SUPPORT ENGINEERS

Provide technical support to customers, sales reps and distributors. Background should include 2-4 years of experience supporting and installing software applications on PCs or UNIX workstations. Extensive knowledge of one or more of the following protocols is desired; TCP/IP, DECnet, NetWare.

SOFTWARE ENGINEERS

- Applications - Responsible for designing and implementing object-oriented applications and application services for network troubleshooting. Must have at least 8 years' development experience with 5 years' Windows or UNIX programming and 2 years with OO portions of C++. Prefer background working in a team developing large applications. RDBMS, OODBMS, Visual C++ and MFC a real plus.
- Protocol Analysis - Responsible for designing/implementing network protocol interpreters and expert network protocol interpreters. Must have minimum 5 years' experience in C/C++, UNIX or MS Windows, working knowledge of networking protocols, networking fundamentals and structured design.

To apply, please send your resume, indicating position of interest, to: Network General Corporation, Employment Dept. NW1, 4200 Bohannon Drive, Menlo Park, CA 94025. FAX: (415) 321-0854. Please, no candidate/agency calls. For a current list of opportunities, please dial Fax On Demand 1-800-764-3329 Doc# 9998. EOE. All trademarks belong to their respective companies.

Network General

DATA SERVICE PROFESSIONALS TELECOMMUNICATIONS

WE ARE UPSIZING, ARE YOU?

While most organizations are shrinking, TCG (Teleport Communications Group) has been growing—new products, increased profits, and more people!

The leader in local telecommunications is embarking on a new era of competition in local services—private line, voice, video, data-LAN, MAN, and WAN. Currently our data services organization has a number of challenging, high-growth positions, including:

- **Engineering** (Switching, Network Management, Applications Development)
- **Operations** (Billing, Installation, Provisioning)
- **Sales** (Account Executives, Sales Support, Business Development)
- **Marketing** (Product Management, Training, Pricing)

Opportunities exist at all levels—entry-level to Director. (Entry-level positions require an appropriate academic degree and relevant intern or co-op experience.) For consideration, forward resume indicating area of interest, salary history/requirements to: **TCG, One Teleport Drive, Suite 300, Dept. RB, Staten Island, NY 10311. Fax (718) 370-4738.**
EOE

TCG

Windows Software Development

Imagine using the latest Microsoft technology developing the hottest PC Networking products on the East Coast - Working with a select group of Windows developers designing software for the rapidly expanding TCP/IP market. Imagine working for an industry leader and feeling like you're working in a start-up environment. Imagine Sun East. If you're a talented Windows Engineer interested in software development or software quality assurance positions or a Software Development Manager who has managed an MS Windows applications development group in the Boston area, please send us a resume.

• C • C++ • Assembler • Chicago • WinSDK • DOS • OLE • Win95
• MFC • Networking Protocols • TCP/IP • PPP/SLIP • GUI • Client/Server

Email: staffing@east.sun.com FAX: (508) 442-0011
US Mail: Sun Staffing East, Dept. EIX, 2 Elizabeth Drive, Chelmsford, MA 01824

Send e-mail to request a complete list of openings at Sun East.

All products or service names mentioned herein are trademarks of their respective owners. We are an equal opportunity employer and encourage women and diversity candidates to apply. No Agency/ Recruiter fees paid.

sun
microsystems

VocalTec

Continued from page 4

ware attempts to determine what information was carried in out-of-sequence packets and re-create it.

Ganor said conversations can remain intelligible with a missing-packet rate of 15%.

The software uses Internet Relay Chat (IRC) to establish impromptu user directories (see graphic) IRC, a real-time data conferencing system, relies on a distributed database system that holds names as well as E-mail and IP addresses of participants while they are on-line.

Ganor said using IRC eliminates problems caused by the way many Internet access providers offer SLIP access via dynamic addressing.

But Martin Horton of Fort Worth, Texas, who has used a beta version of the software, said this reliance on IRC is one of the product's main drawbacks for the corporate market. Speaking for himself, the American Airlines, Inc. software engineer said many companies with Internet firewalls block employee use of IRC.

Even still, Horton said that the software works well, to the point where there are only slight lags in the conversation.

David Goodtree, a senior analyst with Cambridge, Mass.-based market research firm Forrester Research, Inc., said the software will prove useful in certain niche situations, but he doubted the phone companies have anything to worry about.

"It's taken 100 years to develop the voice network, and there are all the great features we've come to rely on, [such as voice mail and call waiting]," he said.

According to Ganor, VocalTec actually is working on voice mail support.

But Goodtree said the phone system also has a common set of standards for such mundane, but critical, functions as connecting phone users across several networks that will be hard for VocalTec to imitate on the Internet. "There's no such development occurring in the [Internet] standards bodies," he said.

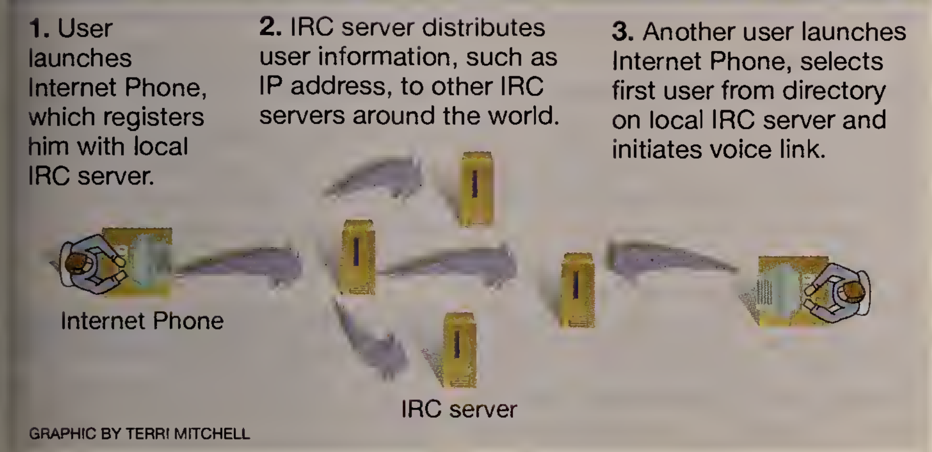
Pat Parseghian, a member of the technical staff at AT&T Bell Laboratories, said the Internet does not currently have the bandwidth to handle large volumes of voice messages, and it is not designed to guarantee delivery of packets.

She added that security on the Internet will continue as a key concern for any companies looking to migrate voice traffic.

Internet Phone is available now, with prices starting at $49 per user.

©VocalTec: (201) 768-9400.

How Internet Phone works


1. User launches Internet Phone, which registers him with local IRC server.
2. IRC server distributes user information, such as IP address, to other IRC servers around the world.
3. Another user launches Internet Phone, selects first user from directory on local IRC server and initiates voice link.
Internet Phone
IRC server

GRAPHIC BY TERRI MITCHELL

PeerLogic

Continued from page 6

classes that can communicate with other classes across a network," said John Rymer, an analyst at Patricia Seybold Group, Inc. in Boston. Rymer said IBM has pitched the Open Software Foundation, Inc.'s Distributed Computing Environment (DCE) as an option for doing this but added that "Pipes is better suited for object communication than DCE's remote procedure calls."

"Pipes is better suited for object communication than DCE's remote procedure calls."

While the firms were not commenting, sources said the move is part of an ongoing effort between IBM and PeerLogic to forge closer product ties. Last September, the companies announced that the Message Queuing series, IBM's message-oriented middleware, will work with PeerLogic's Pipes.

Rymer said other object vendors are forming similar relationships. PeerLogic rival Covia Technologies, Inc. has tucked its Communications Integrator message-oriented middleware into Expersoft Corp.'s Xshell object development tool.

Pipes-enabled versions of DSOM will be available from IBM by the third quarter.

PIPES FOR VB

Separately, PeerLogic is expected next week to announce Pipes Access for Visual Basic, a set of custom controls that will let Visual Basic developers access Pipes services. Pipes Access for Visual Basic is expected to ship in the second quarter and will be bundled with the Pipes Platform for Windows 3.1 at no extra charge.

©PeerLogic: (415) 626-4545; IBM: (914) 765-1900.

Banyan

Continued from page 1

based on its BeyondMail rules engine that will let users define alarm thresholds and automate responses to net problems, said John Paul, Banyan's senior vice president of business development.

The Outlook platform will ship this quarter, and the add-on applications will ship before summer. The rules engine will ship late this year or early next year.

The DeMarc plan distributes management functions across the network, relying on servers acting as domain managers to handle most of the management traffic and forward only high-priority alarms to a central Outlook console (*NW*, Aug. 8, 1994, page 4).

That design differs from most management systems, which constantly poll network nodes for information. Outlook will also use Banyan's StreetTalk directory services to help locate network devices more quickly.

The first iteration of Outlook, which includes the modified version of OpenView for Windows and the new Banyan applications, will let users manage devices on networks running Banyan's VINES network operating system and its Enterprise Network Services for NetWare. Later versions will support ENS for Unix and Windows NT networks.

According to Paul, outlook will support all existing applications that run on top of OpenView, and Banyan's new applications will run on other Simple Network Management Protocol-based management systems, as well. The new applications are called History Collection Agent and Event Manager.

History Collection Agent will sit on servers and collect data on traffic loads or other events defined by the network manager, who can use that information for capacity planning or event tracking, Paul said. The agent will be able to collect data from any device connected to the server on which it sits.

The agent includes a Microsoft Corp. Open Database Connectivity (ODBC) interface so that non-SNMP applications can have access to the data, as well.

Event Manager monitors low-level network events such as traffic loads or bottlenecks and correlates them with higher level events. The application can then launch other higher level applications to reconfigure or reset a network process.

"We're going to turn our rules-based technology into a service on the network. Our vision is toward self-managing networks."

John Paul

MANAGE BY MAIL

Banyan will bolster its DeMarc product portfolio late this year or early in 1996 by breaking out the rules-based engine from its BeyondMail E-mail product and making it available as an independent management service on the network.

It will not be a specific server-based application like Event Manager, but more of a service like StreetTalk that all the management applications can use, Paul said.

Network managers will be able to construct rules with the Beyond technology that DeMarc management applications can use to decide what to do in particular situations.

Event Managers, for example, will get a more sophisticated set of criteria on which to base decisions about relaunching a process, shifting loads from one device to another, resetting a device or notifying a network manager.

The approach could benefit users, but only if Banyan supplies a good front-end tool for building the rules, said Rick Villars, an analyst at International Data Corp. in Framingham, Mass.

"It's not like rules engines haven't existed in other [management] products before, but the challenge has been in making them easy to use," Villars said. "It can be pretty complicated."

The rules-building capability of an E-mail system such as BeyondMail should be simpler to use than that of a traditional management application, he added.

©Banyan: (508) 898-1000.

Cabletron

Continued from page 8

ATM switch management, respectively, that run on those platforms. Cabletron's Spectrum competes with Hewlett-Packard Co.'s HP OpenView, IBM's NetView for AIX and SunSoft, Inc.'s Solstice platforms and is the third leading Unix-based management system in use today, behind Solstice and OpenView, according to International Data Corp. in Framingham, Mass.

Spectrum is the engine behind the automated management aspect of Synthesis. Automated Management is intended to ease the migration to virtual enterprise internetworks by reducing the complexity of network administration. Day-to-day functions such as adds, moves and changes, device configuration, and security and access control features require little, if any, human intervention under the Synthesis plan, said Michael Skubisz, Cabletron director of product marketing.

"[Cabletron] has the capability of scaling by parceling out sections of the management to multiple machines and bringing it all back to a central location," said John Scoggin, network operations supervisor at DelMarva Power and Light Co. in Newark, Del. "The other folks are just beginning to figure out how to do [that]."

DelMarva is a Cisco shop, and Scoggin has evaluated the CiscoFusion switching blueprint. But DelMarva is embracing Synthesis due, in part, to the management capabilities of Spectrum.

Another user that views Cabletron's experience in network management as an advantage is Emory University's School of Public Health in Atlanta. The school has installed Fiber Distributed Data Interface LANs, implemented voice and video applications for faculty and students, and is running an ATM backbone throughout the facility. It also has one of the largest LANs on campus, second to the entire campus-wide network, said Barbara Maaskant, director of computing for the School of Public Health.

"Network management is a whole lot more important for us because of the work we do," Maaskant said. "It might be important enough to swing the decision [on which vendor's vision to embrace]."

The School of Public Health evaluated other vendors' switching strategies, such as Bay Networks', before embracing Cabletron's Synthesis, Maaskant said. Cabletron's experience in network management was "a big factor" in the school's decision, she said.

If there's a shortcoming to Cabletron's switching strategy, it's that the company is developing its own routing software for Synthesis, analysts said.

"That's quite a task," said Skip MacAskill, senior research analyst at Gartner Group, Inc. in Stamford, Conn. "I'm not ready to say that Cabletron can't pull this off, but are users going to look to Cabletron to do the local routing or would they rather see something from an established router player? The routing question is an issue that they're going to have to address constantly."

Comments?

See "How to reach us" on the back page.

Compaq

Continued from page 6

such as NetWare 4.1, UnixWare, Microsoft Corp.'s Windows NT and IBM's LAN Server.

The system also features 32-bit Fast-Wide SCSI-2 controllers, Compaq's TriFlex/PCI architecture and hot-pluggable drive bays, Rector said.

McDOWELL

The ProSignia 300 is designed as a workgroup server and offers a 75-MHz or 90-MHz Pentium processor, error checking and correcting (ECC) memory, a 32-bit PCI local bus Fast-SCSI2 controller, CD-ROM and an optional rack-mounting kit. The server competes with IBM's PC Server 300 and Digital Equipment Corp.'s pcXL 5/90 server, Rector said.

The ProSignia 300 runs NOSes such as NetWare, UnixWare, Windows NT and LAN Server. The server attaches to Ethernet networks and includes three EISA slots, one PCI slot and one shared EISA/PCI slot.

The ProLiant 1500 starts at about $5,400, and the ProSignia 300 starts at $3,200.

SMARTSTART ENHANCEMENTS

In addition to the new hardware, Compaq upgraded its CD-ROM-based SmartStart server setup and program installation product

SmartStart now offers a replicated installation feature. Users can configure one server and copy that configuration to an unlimited number of like servers, said Mary McDowell, director of systems product marketing for Compaq's Systems Division. SmartStart configuration files also now include NetWare 4.1, OS/2 Warp, LAN Server 4.0 and Cheyenne Software, Inc.'s ARCserve backup software.

Compaq also added support to Insight Manager, its Windows-based management tool, for NetWare 4.1, OS/2 Warp and LAN Server 4.0 systems.

©Compaq: (800) 345-1518.

Sprint

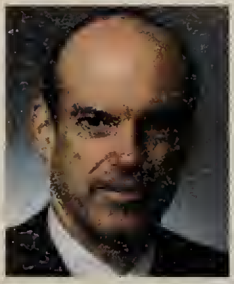
Continued from page 1

get it fast," said the source, a former Sprint employee with close ties inside the company. "You can improve your cash flow by millions with one of these [rate hikes]."

Sprint officials said the stock price is not a controlling factor in adjusting service prices.

"There are a lot of things that we're trying to nail down [with France Telecom and DT] in the definitive agreement," Sprint Chairman Bill Esrey recently told reporters. "They are not driving hard on the terms of price, but whether any adjustments will have to be made, I really don't know."

To help emphasize quality of service over price, Sprint officials have touted their investment in Synchronous Optical Network (SONET) technology that promises automatic millisecond restoral of fiber cuts.



"While our stock price has fallen in recent weeks, we don't think the value of our company has dropped at all."
Bill Esrey

But in the worst possible timing, Sprint last Monday suffered an outage in Texas that spanned three area codes and took 4 1/2 hours to fully repair.

At 9:46 a.m., 99 DS3 circuits went down because of a fiber cut between Calvert and Hearne, Texas. Although some alternate routing began at 9:50 a.m., only 45 of the circuits were rerouted within the first hour.

"We just don't have the capacity to alternate-route 100% yet," a Sprint spokesman said.

"To justify its price increases, Sprint has recently made claims that its service is of the same very high quality as AT&T's. This is evidence to the contrary," said Christine Heckart, a senior consultant for Tele-Choice, Inc., a consulting firm in Verona, N.J.

The sense of urgency at Sprint is reflected in recent personnel moves (see graphic).

For instance, on Jan. 19, Sprint dismissed Rick Simonson, its director of broadband networks. Simonson's responsibilities — for Clearline private lines, Asynchronous Transfer Mode and Signaling System 7 — were handed to Bernie Schneider, who also directs switched digital services, managed frame relay networks and other programs.

DeAngelo said the move did not result from a mandate to cut head count. "It was a decision that I personally made to try to get more efficiencies in the data group," DeAngelo said.

Here's the door

Sprint executives who have left the company:

Paolo Guidi
President, Sprint International
Resigned in December 1994
Rod Mack
Senior vice president for information systems
Resigned Jan. 27
Rick Simonson
Director of broadband services
Dismissed Jan. 19
Norman Black
Director of public relations, Business Services Group
Dismissed Jan. 19

Sprint is likely to be under cost pressures for some time. While the Sprint-led consortium is bidding billions for PCS licenses, there is no assurance that the winning bids will lead to significant revenue any time soon.

There's also no assurance that Sprint will get the new cash infusion from France Telecom and DT. The proposed FCC rule on foreign ownership would require that U.S. carriers have "effective market access" — also known as reciprocity — into the foreign country before the deal could go through.

"Reciprocity is a notion with powerful appeal."
Reed Hundt

Until now, the FCC has ruled on foreign ownership based largely on whether the foreign carrier will be able to discriminate in favor of its U.S. partner.

To deal with complaints about closed foreign markets, Sprint officials have repeatedly pointed to a declaration by the European Union that it will open up markets on Jan. 1, 1998. But such a declaration does not meet the "effective market access" test in the proposed rule, said Scott Blake Harris, chief of the FCC's International Bureau.

It must include items such as interconnection of networks with competitors' facilities, he noted, conditions that have yet to be met in France or Germany.

Meanwhile, FCC Chairman Reed Hundt has been jawboning foreign carriers to move toward more open competition. "If Germany wants to lead in European telecommunications, it must set a faster pace than Brussels has done so far," he recently told an audience in Bonn, Germany. ◘

Bundling

Continued from page 1

But vendors that are not on the carriers' customer premises equipment (CPE) menu can be shut out of lucrative deals, while users, especially smaller businesses, find their choices limited to products they may not want.

Still, users and vendors ensconced in carrier arrangements generally like the idea.

"Problems get fixed faster than we could fix them ourselves," said Coyne Gibson, director of systems architecture at Convex Computer Corp. in Richardson, Texas. In Gibson's case, WilTel assumes full responsibility. If there's any finger-pointing, he doesn't see it, and problem turnaround is now two to four hours vs. the two to four days Convex managed on its own.

Likewise, vendors see bundling as the wave of the future.

"When the PC LAN business started, a whole new market channel was created — the [value-added reseller] — and I believe something similar has started happening in wide-area communications," said Jim Flach, a partner with San Francisco-based venture capital firm Accel Partners and chairman of Teleos Communications, Inc., a vendor of LAN and WAN video equipment.

Service providers would seem to be in a natural position to fill this role, but they face the same challenge driving customers to off-load their network administration: The technology is difficult to manage, and networks are becoming tougher to troubleshoot.

Flach said Teleos has had to turn down Fortune 500 corporations that have asked it to bid against MCI Communications Corp. and AT&T for the maintenance of their videoconferencing networks.

"Here we are bidding against the likes of AT&T because the customer hopes we can provide better service than they can," Flach said. "We're this little peanut-size company — it's ludicrous."

WHERE THE PROBLEMS LIE

About 60% to 70% of the time problems are on the service side, Flach noted, and many times it's due to the carrier's lack of knowledge about the equipment linking the user to its net.

Maintenance issues like these are what drive carriers to work with as short a list of vendors as possible. But that results in a double-edged sword for users — quality service and support but lack of choice.

Advanced Computer Communications (ACC) — 51% owned by heavily bundled Newbridge Networks Corp. — right now is "jumping through hoops" to have its Danube branch router certified by an interexchange carrier (IXC) in order to satisfy one particular customer, said Gary Krall, ACC's vice president of marketing.

The IXC is a Cisco bundling partner and won't work with ACC's Danube because it hasn't been certified.

"It's extremely difficult for a firm like ACC to get in on these kinds of bids when the customer has a hard time seeing that we're even a choice," Krall said.

Indeed, "it's difficult to walk away from the carriers when they come in with a completely integrated and workable solution just because the equipment isn't exactly what you wanted," said David Ellis, director of network services for The Home Depot, Inc. in Atlanta.

Ellis ran into such a snag with AT&T's frame relay offering. The firm wanted to install Hypercom, Inc. routers, but AT&T insisted on using Cisco devices. Home Depot stuck to its guns, and AT&T relented, coordinating directly with Hypercom to make the system work.

"If you're a three- or four-site operation, you're going to take what the carrier has to offer," said Dennis Tsu, senior director of product marketing for Network Equipment Technologies, Inc. "But if you're a bank with 500 locations, they'll give you what you want."

Virgil Palmer, manager of engineering and research services at Air Products and Chemicals, Inc. in Allentown, Pa., agreed.

"It all depends on how well you build the contract," he said. "You can stipulate any possible situation; it's just a matter of how good you are at putting the contract together and then managing it, making sure the agreements are met."

Bundle o' money

Bay Networks said router sales through carriers represent 20% to 30% of its annual revenue, while Cisco reported nearly one-third of its revenue comes from the carrier channel. Cisco expects **$100 million** in revenue this year from AT&T alone, twice as much as last year.

On the other hand, revenue from carrier resale arrangements has been fairly flat for General DataComm, accounting for **5.2%** of sales in 1994, up from 3% in 1989. Likewise, ACC said such deals accounted for **11%** of its total revenue for each of the last three years.

But some believe timing is a big part of inclusion in a carrier's exclusive bundling club.

"Back in 1991, there was a lot of negativity about frame relay, and some vendors held back waiting to see how it went," said Convex's Gibson. "Those that are in tight now are there by virtue of getting in early and expending lots of money and effort when the others may have hesitated."

No matter how or when vendors' products end up on the carrier's CPE menu, users are confident that the telephone company will ultimately learn the nuances of those devices.

"We saw the same thing initially with frame relay while they figured it out," Palmer said. "They just have to throw resources at it, and there's a big enough market waiting to justify them doing that."

➡◆ Senior Editor Michael Cooney and Senio Washington Correspondent David Rohde contributed to this story

Client/server

Continued from page 1

which customers are charged a minimum monthly fee in addition to a per minute fee for connect time to the client/server system.

SHOWTIME FOR EDI

Each evening's box office results are collected by EDI employees over the phone and input via terminals into an Informix Software, Inc. On-Line 7.0 database that runs on an eight-processor Sequent Computer Systems, Inc. S2000/750 server.

The client/server system, dubbed Film Source, is due to roll out in April and will give hundreds of customers direct access to box office information in the Informix database over dial-up lines.

KEYS to the MOVE

- ✓ To avoid security breaches, give customers dialing in to a database only read access.
- ✓ User input is great, but make sure a programmer or analyst is included in any application specifications developed.
- ✓ Highly indexed data and stored procedures are not required to exploit the database's parallel processing capabilities, but they do improve performance.

A set of predefined views will be delivered automatically to users when they dial in, but customers will also be able to further query the read-only database at their discretion.

The system will enable these users, whose careers may hinge on theater traffic, to generate custom reports using a Windows-based application written with Gupta Corp.'s SQLWindows and provided by EDI.

EDI will also offer a turnkey service consisting of a PC and the application software.

The client/server setup is a far cry from the previous paper-based system, in which box office information was both collected and stored in the same way.

While no special programming is required to take advantage of parallel processing, highly indexed data and wide use of stored procedures can further improve performance, according to Huber.

"In the past, customers could call and request custom reports, and we'd put a programmer on it," Huber said.

The amount of information available to customers will increase "exponentially" now that customers can assemble their own reports, he said.

A BULLETPROOF SYSTEM

Because EDI only makes money when customers are buying its data, the information system's reliability is crucial.

To that end, Huber has taken several steps to bulletproof the system.

First, EDI is using data replication — a feature that is built into the Informix database — to update two other databases that are kept in offices in London and Munich, Germany.

In the event that the main server here crashes, EDI could switch over to either European database with little consequence, Huber explained.

Currently, data is replicated nightly, but eventually, EDI will exploit the database's ability to do real-time replication so databases will be synchronized up to the last transaction.

EDI is also exploiting the parallel processing capabilities of the Informix database, which Huber said allow him to build complex logic into his database without slowing performance.

"It really pays off when you have a bunch of users hitting the database with SQL statements. Those statements don't have to line up and wait for that one processor," he said.

While no special programming is required to take advantage of parallel processing, highly indexed data and wide use of stored procedures can further improve performance, Huber said.

"Our information is only good for a day, so it tends to push the limits of any system. Still, we're confident that client/server will deliver and actually help us expand our business," he said. ☑

PacBell

Continued from page 6

many of the referrals, the carriers proceeded to 'unhook' our customer and instead sell the customer a packaged intra- and inter-LATA service," Dorman stated in the affidavit.

But the benefits to having the local exchange carriers in the inter-LATA 800 arena are unclear, said Phil Evans, director of telecommunications at Perot Systems Corp. in Dallas. "I don't think users care who carries the call as long as they have the [800-number] portability and economies they contracted for," he said.

Also last week, Bell Atlantic Corp. sued MFS Communications Company, Inc., the parent company of competitive access provider MFS Telecom, Inc., claiming that its tariffs do not give sufficiently specific rates, as required by a recent court ruling. MFS said the charge is without merit.

Bell Atlantic also sued AT&T last week, claiming AT&T was misleading customers in New Jersey by advertising low intra-LATA toll call rates but not advertising that the rates were promotional and short term.

But in an about-face, Ameritech Corp. said it would now open its local nets in Illinois to competitors without the precondition of being allowed into the long-distance market.

➾Senior Editor Joanie Wexler contributed to this story.

Wireless

Continued from page 1

assistance from central network groups.

For example, after a six-month companywide study, 3M Corp. in Minneapolis recently appointed an individual within its systems group to be solely responsible for evaluating, recommending and purchasing wireless services, portable devices and mobile applications.

George Allman, 3M's mobile IS designee, says his role is to ensure that mobile efforts blend with other information systems initiatives from interoperability, security and volume discount standpoints.

Janet Boudris, RAM's vice president of marketing, acknowledged that her company is seeing more synergy between business managers and network staffs than it had a year ago.

"The original request may still come from the head of sales or field service, but now IS steps in, evaluates and tests products and decides what to implement," she said.

Managers in other companies, though, still see a parallel between mobile trends and the days of PC anarchy.

"The same problem is there," said Karl Kaste, manager of technology assessment at Genentech, Inc., a biotechnology firm in South San Francisco. "The business unit asks IS for an application. IS, which doesn't understand mobile development issues, says, 'Sure, you can get it in three years.' So the department goes to some kid fooling around on the Internet who can build the app in a weekend."

In Kaste's opinion, the central network and systems staff should define architectures, access protocols and security schemes.

Then, as is the case at Genentech, it should be up to departments that operate their own IS budgets to choose devices and software.

Kaste and Ameet Patel, manager of advanced technologies at BASF Corp. in Mount Olive, N.J., share the view that business users with dire needs will become the wireless champions.

But Patel warned that when it comes to data, "you better involve IS because you have to get into the corporate network."

Ken Dulaney, vice president of mobile computing at Gartner Group, Inc., a consulting firm in Santa Clara, Calif., agreed that mobile advocates that circumvent network planners will be in trouble. He expressed concern that "people haven't figured out that mobile applications involve a whole second client/server architecture."

But how companies team to blend mobile and wireless protocols and applications into the enterprise depends as much on the firm's size as anything, said Richard Cortese, president of Racotek, Inc., a wireless systems integrator in Minneapolis. He said large companies are likely to pull in the central network staff, while business executives are likely to make the mobile decisions at smaller companies.

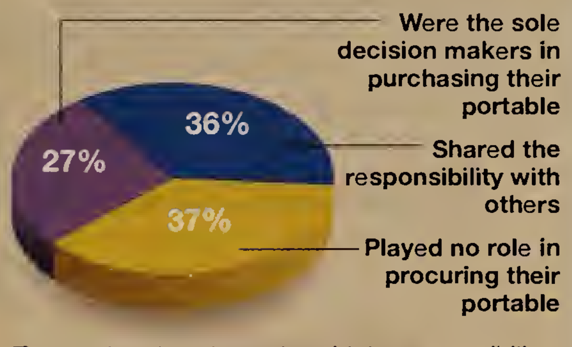
And wireless electronic mail is more likely to fall prey to ad hoc purchase trends because, like cellular phones, it can be used in parallel with existing systems rather than having to interact with them.

In fact, RadioMail Corp., a wireless messaging application and services gateway provider in San Mateo, Calif., is still approaching people at the departmental level, according to Steve Rand, vice president of marketing.

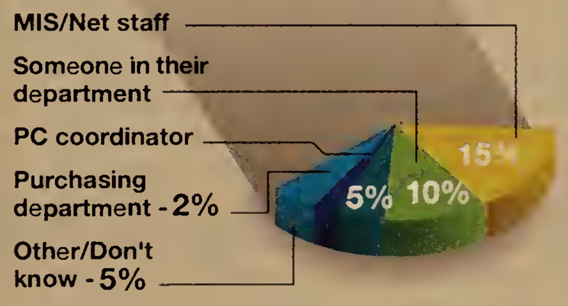
"We're not talking to the CIO at this point — unless it is after the fact," he said. ☑

Sign of the times?

Just over half of 300 mobile professionals surveyed connect back to their offices via portable computers. Of those:



Those who played no role said the responsibility fell on:



BIS says the number of sole decision makers will probably be greater for cellular phones and personal organizers but much smaller when wireless data services enter the picture because of the integration efforts required.

Xylogics

Continued from page 8

means installing and managing a whole separate access system for them," said Joanne Womboldt, director of product management for Xylogics.

"We also find that remote access is becoming more of a strategic, enterprise initiative," she said. "It started as a tactical decision among different departments in an organization, and after two years now, the [chief financial officers] are finding all these access costs hidden in those separate departments."

The 4000's modular 72-port design addresses this concern by consolidating remote access needs on a single high-capacity server. Security risks are also reduced, as it leaves fewer entry points into the net.

An optional software package, Redirector, also lets users on the LAN dial out through the server, eliminating the need for separate modems at each PC. The servers also can be used for LAN-to-LAN dial routing concurrently with remote user access.

The Remote Annex line supports Windows-based remote users running Xylogics' FastLink II remote node client software, which supports IP, IPX and AppleTalk-based LANs. Over the wide area, Point-to-Point Protocol (PPP), Serial PPP, IP and IPX are supported. The server can automatically detect which WAN protocol is being used on a per-call basis, eliminating the constraint of having to dedicate certain ports to certain protocols.

"That's an important feature that makes the whole system easier to use and administer, and I think autodetect will soon be a mandatory feature for all vendors," said Christine Heckart, a senior consultant with TeleChoice, Inc. in Verona, N.J.

Xylogics' enterprise focus is well conceived, Heckart said. "Firms are getting out of the pilot stage with this technology, and once MIS starts realizing how much money they'll spend on remote access, its whole purpose becomes much more strategic. People will want to centralize as much as they can."

Available now, both models include unlimited client software licenses and 30 days of free telephone support, beginning whenever the first call is placed.

Pricing for the Remote Annex 2000 starts at $2,695, and the 4000 starts at $4,795.

☎Xylogics: (617) 272-8140.

CE Software partners up for enterprise push

BY ADAM GAFFIN

West Des Moines, Iowa

CE Software, Inc., best known for its Macintosh-based electronic mail package, furthered its push into the enterprise arena last week with a deal to resell Boston Software Works, Inc.'s directory synchronization and message translation software.

The message switch, dubbed InterOffice Message Exchange, will let customers tie together multivendor mail systems. It will play a key role in CE Software's evolving groupware strategy, along with the company's TeamVision tools for linking proprietary E-mail, database and calendaring applications across an enterprise. CE Software said it expects to deliver the first TeamVision-enabled applications by midyear.

Moreover, the message switch will help the company, which also sells calendaring software, compete in a messaging arena increasingly dominated by much larger vendors such as Lotus Development Corp. and Microsoft Corp.

The message switch will help the company compete in a messaging arena increasingly dominated by much larger vendors such as Lotus and Microsoft.

InterOffice can run on a variety of platforms and can handle message translation and directory synchronization among packages, including Microsoft Mail, Lotus' cc:Mail, Digital Equipment Corp.'s All-in-1 and Hewlett-Packard Co.'s HP OpenMail, as well as CE Software's own QuickMail. It also supports systems based on 1988 X.400 standards, the Simple Mail Transfer Protocol and Novell, Inc.'s Global Message Handling Service. Support for IBM Systems Network Architecture Distribution Services (SNADS), Lotus Notes and Banyan Systems, Inc.'s Intelligent Messaging will be added later this year, along with support for 1988 X.500 directories.

Server software can be installed on platforms ranging from Tandem Computers, Inc. mainframes to a variety of Unix platforms.

David Ferris, president of Ferris Networks, Inc., a San Francisco E-mail consultancy, said the offering may be attractive to companies that do not want to be tied to a particular hardware platform. He contrasted this with Lotus' Lotus Messaging Switch — formerly EMX — which now runs only on Unix platforms from Data General Corp.

He said the Boston Software Works product provides robust directory synchronization and message translation services but has not yet made much penetration into the market.

TeamWare's goal is to give end users a single interface to retrieve and submit information across a network, regardless of whether they are communicating with another user, a relational database or a calendaring application.

Nina Burns, president of Creative Networks, Inc., a San Francisco E-mail consulting firm, said the approach is a good one since users are always looking to integrate disparate applications.

Pricing for InterOffice ranges between $4,500 and $24,000 per module, depending on platform and supported E-mail packages.

©CE Software: (800) 523-7638.

NETWORK WORLD

161 Worcester Road
Framingham, Mass. 01701-9172
(508) 875-6400

Second-class postage paid at Framingham, Mass., and additional mailing offices. Posted under Canadian International Publication agreement #0385662. *Network World* (USPS 735-730) is published weekly, except for a single combined issue for the last week in December and the first week in January by Network World, Inc., 161 Worcester Road, Framingham, Mass. 01701-9172.

To apply for a free subscription, complete and sign the qualification card in this issue or write *Network World* at the address below. No subscriptions accepted without complete identification of subscriber's name, job function, company or organization. Based on information supplied, the publisher reserves the right to reject non-qualified requests. Subscriptions: 1-508-820-7444.

Non-qualified subscribers: $5.00 a copy; U.S. A $95 a year; Canada A $117.70 (including 7% GST, GST #126659952); Central & South America A $110 a year; Europe A $165 a year, all other countries A $245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Please include mailing label from front cover of the publication.

Network World can be purchased on 35mm microfilm through University Microfilm Int., Periodical Entry Dept., 300 Zebb Road, Ann Arbor, Mich. 48106.

Network World is distributed free of charge in the U.S. to qualified management or professionals who meet ALL of the following criteria:
1) Have site purchasing influence.
2) Are involved in the purchase of network products and services.
3) Have multi-platform networks installed or planned (including network architectures, LAN operating systems and LAN environments).

PHOTOCOPY RIGHTS: Permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by Network World, Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus 50 cents per page is paid to Copyright Clearance Center, 27 Congress Street, Salem, Mass. 01970.

POSTMASTER: Send Change of Address to *Network World*, P.O. Box 3090, Northbrook, IL 60065.

Copyright 1994 by Network World, Inc. All rights reserved. Reproduction of material appearing in *Network World* is forbidden without written permission.

Reprints (minimum 500 copies) and permission to reprint may be purchased from Reprint Services, 315 5th Ave. N.W., St. Paul, MN 55112 (612) 582-3800.
ISSN number: 0887-7661.

Spectrum

Continued from page 8

Robert Dole (R-Kan.) and others in Congress, decided to let Part 15 equipment continue operating in the 902-MHz bands under a complex set of new regulatory and technical rules. The guidelines are aimed at fostering coexistence between Part 15 devices and the uncertain number of AVL providers that will soon inhabit the band with them.

But even the commissioners questioned whether this please-all approach can work. "This Report and Order will be but our first step into a potential bog of interference problems," said Commissioner James Quello. "I hope I am wrong, but I fear I am right."

Commissioner Andrew Barrett said the FCC should have waited for the results of detailed radio interference testing before making its decision.

Several companies, including Pinpoint Communications, hold experimental AVL licenses, but only one, AirTouch Communications, Inc.'s TeleTrak service, is actually operational, with service in six cities and licenses for 100. "We're very pleased with the commission's decision," said Susan Rosenberg, communications manager for AirTouch.

She said spectrum-sharing is feasible in most places. Because TeleTrak will likely be allowed to operate under a grandfather clause in the FCC rules, the firm probably will not buy spectrum in an auction. But radio equipment from Metricom, Inc., for instance, could face problems with these new rules due to power restrictions on high antennas, acknowledged Henry Rivera, lawyer for both Metricom and wireless user Southern California Edison Co.

The FCC rules also single out devices such as sensor equipment as interference-prone, making them targets for removal if an AVL provider complains to the FCC.

"Coexistence simply isn't possible," Wright said.

Exchange

Continued from page 4

Protocol and X.400 messaging protocols, as well as TCP/IP. It also contains encryption-key and digital signature security.

Server-to-server replication is part of the initial release, but server-to-client replication will ship later, said Greg Levin, a product manager in Microsoft's business systems division.

NASH

The availability of Exchange Server will complete Microsoft's BackOffice suite of server products, said Mike Nash, a Microsoft Windows NT Server group product manager.

The product comes tightly integrated with BackOffice and Windows applications through mutual support for several key Microsoft technologies, including OLE, Dynamic Data Exchange and Open Database Connectivity. Exchange Server connects with other E-mail systems that support Microsoft's Messaging Application Programming Interface.

The messaging software is designed to mail-enable applications, so users can send messages without switching among applications, said Dilsad Uvez, a product manager in Microsoft's messaging business unit. Each mail message identifies by icon the application program that created it and automatically runs that program when users edit a message.

Network managers can define as many as seven different types of users, based on access and capabilities, and tie the permissions to the network logon through Windows NT. An Exchange Server client can run with an Exchange Server or a Microsoft Mail 3.X server, Levin said.

However, Microsoft is also offering what product managers call a "source extractor" to help systems managers migrate to Exchange Server from Microsoft Mail, other LAN-based E-mail systems or even host-based systems. A "migration assistant" to convert directories will also be offered, Microsoft officials said.

Exchange Server's tie to Windows NT does not end with a universal logon. Net managers can designate such features as queue sizes for gateway traffic and service monitors for LAN activity.

Each Exchange Server client can have a custom desktop. The product's universal in-box collects messages from a variety of sources, such as fax transmissions and on-line services (including the Microsoft Network announced last fall).

Microsoft aligns BackOffice

Microsoft Corp. will further tighten integration among its BackOffice products in the next few months with updates to its server suite and the Windows NT operating system.

Microsoft Windows NT 3.51 is a maintenance update scheduled to ship in the second quarter. It will support PowerPC systems and PCMCIA peripherals, said Bob Kruger, director of technology marketing and standards.

With each update, the client/server operating system and Microsoft's family of server applications become more interdependent, sharing resources for faster and more efficient performance.

With each update, the client\server operating system and Microsoft's family of server applications become more interdependent.

For example, SQL Server 95, now in beta test, supplies data for Systems Management Server (SMS) and shares user directory data with Exchange Server, the Microsoft Mail replacement nearing release (see story, page 4). SNA Server is the fourth application in the BackOffice suite.

"Interoperability is a priority," Kruger said.

Windows NT 3.51 will include a central security account manager (SAM) that offers directory services and other information for all the server applications to use, said Tanya van Dam, BackOffice product manager. BackOffice applications will share TCP/IP address and post office information, and users will get access to all authorized applications through a single logon.

Setup screens and the user interfaces will be common across the BackOffice server suite and will be managed primarily through SMS, van Dam said. Microsoft is also providing a common set of administration tools for Windows NT Server Edition and the BackOffice applications, which will be updated in the same time frame, van Dam said.

Similarly, Microsoft will bring the client edition of Windows NT in line with Windows 95, which is slated for release in August.

Windows NT Desktop Edition Version 3.51 is scheduled for release in the second quarter. It will also support the PowerPC and NT File System (NTFS) compression. However, the Windows NT Desktop Edition's interface still resembles Windows 3.1 more than Windows 95.

BY PEGGY WATT

ONE OF THE MOST POWERFUL NETWORKING TOOLS EVER.

It gives you more control over the flow of vital business information. It protects the biggest equipment investment you'll ever make. It saves you tons of time. What one networking tool can do all this? NetWorld℠+Interop® 95 Las Vegas.

See more than 600 leading vendors demonstrating all their latest products. Watch ATM, high-speed networking, the Internet, client-server and more work together. Best of all, test solutions that are vital to your business on the world's most diverse, fully deployable gigabit network: the InteropNet™.

You can also get hands-on experience at our Network Applications Test Drive Center. See in-depth, multivendor demonstrations of the hottest high-speed networking technologies at our exclusive Solutions Showcases℠. Check out new, cutting-edge Internet products and services on the expo floor. Even tour the InteropNet to get a first-hand look at how the most talked about technologies are being implemented in a real, live network environment.

Don't miss the industry's premier interoperability event. NetWorld+Interop is the fastest, easiest way to see all the top networking solutions. So what are you waiting for? Order your FREE show badge today.

SAVE $50—MAIL/FAX THIS FOR YOUR FREE PASS!

Name______________ M28
Company______________
Address______________
City, State, Zip______________
Phone/Fax______________

Fax: 415-525-0199 • Mail: N+I 95, P.O. Box 5855, San Mateo, CA 94402-0856

NETWORLD℠+INTEROP®

EXHIBITION RUNS MARCH 28-30 • CONFERENCE RUNS MARCH 27-31
LAS VEGAS CONVENTION CENTER • CALL 800-488-2883 FOR MORE INFORMATION

© 1994 SOFTBANK Exposition and Conference Company (SOFTBANK Expos). Interop is a registered trademark of SOFTBANK Expos. NetWorld is a service mark of Novell Inc. All other names are the property of their respective holders.

The World's Leading
Database,
Client/Server,
& Networking
Exposition & Conference

DB/EXPO 95

Piecing IT Together

Featuring 24
Full & Half Day
Tutorials

Expanded Conferences
Now Includes Networking
Executive
Database & Client/Server
Networking & Interoperability
Data Warehouse & Parallel Computing

Over 250
Expert
Speakers

Over 900
Dynamic
Exhibits

Need to solve
the IT puzzle?
Call today for
your free
brochure:

1-800-2DB-EXPO

Please send me:
- ☐ My DB/EXPO '95 Conference Brochure
- ☐ ____ Complimentary Exhibit Passes
- ☐ Information on becoming an exhibitor

2111

Name: Title:
Company:
Street: Mail Stop:
City: State: Zip:
Telephone: Fax:
E-Mail Address:

24 HR FAX FORM: (415) 966-8934

Conference: May 1-5, 1995
Exposition: May 2-4, 1995
Moscone Convention Center
San Francisco, California

BLENHEIM

Blenheim NDN, Inc. is a subsidiary of Bruno Blenheim Inc.
444 Castro Street - Suite 1101 - Mountain View - California 94041
Tel: (415) 966-8440 - Fax: (415) 966-8934

Back to Reality

Uncle Sam looks to ban Internet sex addicts; IRS recants database plans.

BY DAVID J. BUERGER

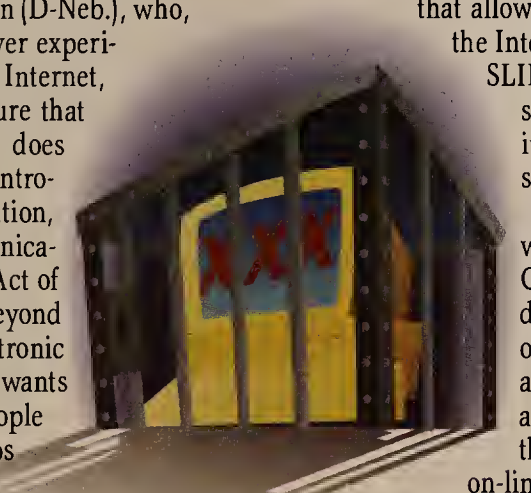
Last week, the world was bored. O.J.'s trial was stagnating. No big new scandals. Even networking vendors were bored, or at least had little to say.

It used to be that the week of Networks Expo (formerly called NetWorld when NetWare was just a workgroup NOS) would pack the newspaper with networking announcements. Now it's a yawner.

Internauts are so bored that they've turned to the one sure fix for ennui: sex. That's right, sexual fantasies are oozing through the net. According to Jayne Levin, editor of the Washington, D.C.-based "Internet Letter," some of the most active Internet discussion groups are about sex.

I know for a fact that this is true.

Levin's last few newsletters have published addresses for several X-rated home pages. For strictly research-oriented reasons, I tried to look at them. Never got a peek. The damn things were so busy that excess traffic shut them down.



Sen. Jim Exon (D-Neb.), who, like me, has never experienced sex on the Internet, is sworn to ensure that no one else does either. His just-introduced legislation, The Communications Decency Act of 1995, goes beyond forbidding electronic interludes. He wants to punish people who write no-nos in cyberspace.

That's right, folks. If his wish becomes law, any employer, E-mail service provider or carrier could become labeled a criminal — liable for up to $100,000 in fines or two years in prison. You could become "jailbait" just for allowing passage of an "indecent" flame.

"I want to keep the information superhighway from resembling a red-light district," the senator said.

Gimme a $%!*@ break.

If you'd like to read an analysis of this legislation and find out how to send this yo-yo back to reality, contact Sarah Reardon at the Electronic Messaging Association at sreardon@ema.org.

Then again, you might want this dumb idea to become law. That could be an interesting role — network managers as ministers of morality. Yech.

Talk between yawns

News about VocalTec, Inc.'s software that allows phone calls through the Internet via 14.4K bit/sec SLIP links jostled me from slumber. I wondered, is it a plot to make us talk slower?

Apparently not. It works. Well, sort of. Connections are half-duplex, which means only one party can talk at a time. (That could be a good feature.) And they must already be on-line at the same time.

The Big Telephone Companies laughed at this news. "The Internet has no security, a capacity shortfall and no guaranteed delivery." Yada, yada, yada.

Some users won't care about those drawbacks, especially if they can save some bucks. My motto is: If the phone companies say it can't be done, it will be done.

Look out, Ma.

Another case of Big Egos butting into obstacles of their own design are the grandiose (and different) plans of IBM and Novell, Inc. to control everything you buy at Office Mart through a PC. Microsoft Corp.'s similar At Work software just shipped — a year late. Why can't these guys ever cooperate instead of strutting around, each trying to rule the world?

Wake up! It's update time

Before you really fall asleep, recall my story about the massive database planned by the Internal Revenue Service? Yeah, now you're awake. An IRS spokesman returned my call and asked, what publication is *Network Rogue*? Now that instills confidence in their record-keeping ability.

I guess the IRS woke up, too, after a zillion people complained. The spokesman said they are rewriting the plan.

"It didn't read as well as it should," he said. Get out of town! "We never meant to do research on individuals. Our goal was to research broad markets." Hmm, OK. "Broad research is stripped of individual identifiers, and there's a wall between people in research and examinations." Gee, I feel better now.

I did ask him to change my database record from *Network Rogue* to *Network World*. You know, bad image.

More diversions

After reading last week's story about the plumber who had calls to competitors forwarded to his office, alert reader Dave Shaw recalled a similar situation — from 1889.

Almon B. Strowger was a Kansas City undertaker. Legend has it that his switchboard operator was married to the town's other undertaker. Guess who diverted calls and business from Strowger?

The result of Strowger's frustration was his invention of what he called a "girl-less, cuss-less" telephone switching device.

Ironically, early users didn't like automatic switching because they had to push buttons and dial numbers on their phones. That was the telephone company's job, they said. The rest is history.

Telling you that little bit of history was a calculated move. Now you can lay your head down and really catch a snooze.

➾ Buerger is an Atlanta-based industry consultant and contributing editor to *Network World*. He can be reached at (404) 495-7494 or at dbuerger@pipeline.com.

How to reach us

Call: (508) 875-6400

Fax: (508) 820-3467

Write: *Network World*, 161 Worcester Road, Framingham, Mass. 01701

Internet: network@world.std.com

MCIMail: 390-4868

Network Help Desk: Contact Allison Conliffe by any of the means above or via the Internet at aconliffe@world.std.com

Reader Advocacy Force: Leave us story tips or information about problems with products at (800) 622-1108, Ext. 487, or via the Internet at nwraf@world.std.com

BBS: Interact with other readers, download free software or leave story tips through our bulletin board system by dialing in at up to 9.6K bit/sec to (508) 620-1178 or (508) 620-1160.

Subscriptions/Address Changes: Contact the Circulation Department at our main address or drop a message through the Internet to nwcirc@world.std.com

Windows Connectivity Forum (sponsored by *Network World*): Type GO WINCON at any ! prompt on CompuServe.

Reprints: Reprints are made available in quantities of 500 to 10,000 by calling (612) 582-3800.

CyberSpeak

Voices from the reader network

Is the law prohibiting carriers from bundling equipment with tariffed services outdated?

◆ "As long as there are dominant carriers in the business, they can't be allowed to bundle. The law itself may need upgrading. You ought to take a look at everything over time.

"Once there are multiple carriers and there's real competition out there for everything in the package that's liable to be bundled, then there's no more reason for the law. We have to get to a competitive situation, and we're not there yet."

Bob Wallquist, vice president of regulatory affairs, Tel-Communications Association, Inc., Foster City, Calif.

◆ "Yes. It should be changed. It limits carriers in their offerings of complete end-to-end service. It ties the carriers' hands. They can't put it in one package, one billing arrangement. To me, that's more of a problem to operate when you have separate bills for equipment and service. I would rather see the whole service and the [equipment] cost on one bill."

Eddie Wilson, president, AT&T Digital Services Users Group, Atlanta

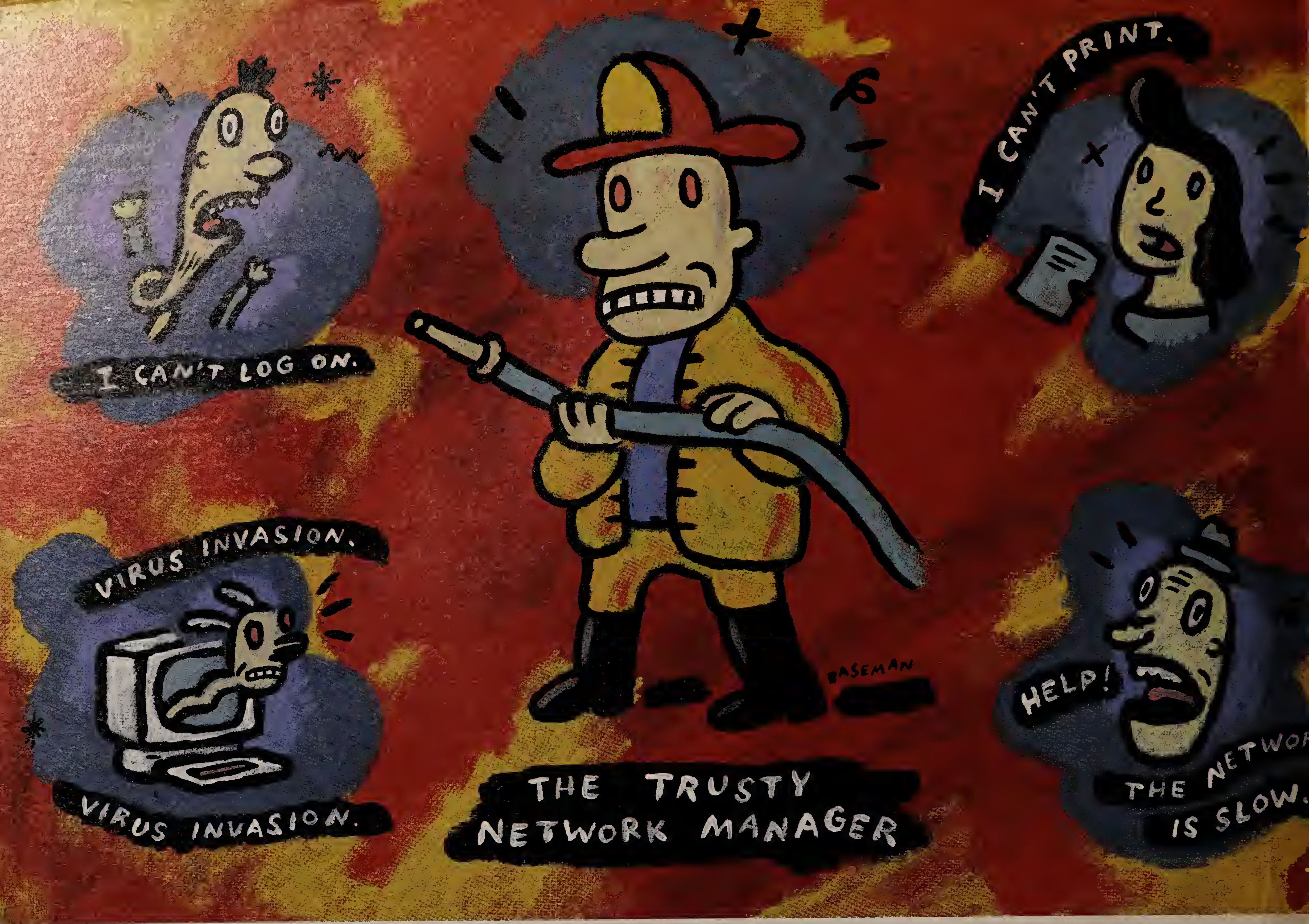
◆ "The law is not outdated because it allows the particular customer to get the right equipment to fit their particular needs, knowing their company better than the telephone company would."

Bruce Cavallaro, senior network analyst, Rochester Community Savings Bank, Rochester, N.Y.

NextWeek CyberSpeak Out!

Who makes wireless equipment and service decisions at your company, the network and systems staff or the business units?

Responses due by 8 p.m. Thursday, Feb. 16. You'll get a T-shirt if we print your response. Please include your name, company and address.


I CAN'T LOG ON.
I CAN'T PRINT.
VIRUS INVASION.
VIRUS INVASION.
THE TRUSTY NETWORK MANAGER
BASEMAN
HELP!
THE NETWOR IS SLOW.

Fire fighting is good. Fire prevention is better.

Running around the office trying to extinguish one network crisis after another probably isn't what you want to do all day.

That's why Novell and Intel, the leaders in networking and desktops, bring you the ManageWise™ solution in one, integrated product.

NOVELL.
intel Network Technology from Intel
ManageWise
Smart Management for Pervasive Computing from Novell

THE SMART WAY TO MANAGE YOUR NETWORK

ManageWise gives you end to end control of all aspects of your network.

Now if users have problems like "I can't print" or "The network is slow," you can solve them easily from your desk.

With ManageWise those stressful network fire fighting days become a thing of the past.

intel

Network Technology from Intel

START FIRE PREVENTION NOW
CALL NOVELL AT
1-800-665-4586

NOVELL